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An Address

ON THE PRESENT POSITION OF DIABETES AND GLYCOSURIA, WITH OBSERVATIONS ON THE NEW INSULIN TREATMENT.

Delivered at the Congress of Public Health, Scarborough, on May 18th, 1923,

BY HUGH MACLEAN, M.D. ABERD., D.SC. LOND., M.R.C.P. LOND.,

PROFESSOR OF MEDICINE, UNIVERSITY OF LONDON (ST. THOMAS'S HOSPITAL).

SINCE the classical observation of Thomas Willis in 1675 that the urine in diabetes contained sugar, no disease, perhaps, has been the object of so much combined clinical and laboratory investigation. Despite all this, we are to-day almost entirely ignorant of the nature of the fundamental defects in metabolism which give rise to diabetes, and it is fairly safe to prophesy that the mystery will remain unsolved until the secrets of general metabolism are fully unravelled. We are still very far from this enviable position, and our present knowledge of diabetes resembles a mechanical puzzle in which only a few of the pieces have been placed in their proper positions. Within recent years, however, our *clinical* conception of diabetes has been placed on a more secure foundation, for we are now able, in the great majority of cases, to say definitely whether or not a patient suffering from glycosuria is also suffering from diabetes. That this is an important fact will be recognised by all who have been called upon to decide whether or not a patient with glycosuria was really diabetic. A celebrated London physician, in discussing this question with me some time ago, made the following remark :—

"I have been watching patients with glycosuria for more than 25 years. Many of these patients whom I thought, when I first saw them many years ago, to be suffering from early diabetes, are still alive and as fit as, or more fit than I am. Others, whose condition I looked on as probably of little importance, are long since dead of diabetic coma."

This, I think, sums up the position admirably, and must appeal to all of us who have had any experience in dealing with this disease.

NEWER METHODS IN INVESTIGATING GLYCOSURIA.

When a patient who happens to be suffering from glycosuria consults his doctor it is not an unusual experience for the glycosuria to be discovered more or less accidentally in the course of routine examination. If such a patient feels somewhat run down and out of sorts, and physical examination results only in negative findings, there is a very great temptation immediately to ascribe the patient's condition to diabetes. In many such cases experience shows that the glycosuria is purely accidental, and has nothing whatever to do with diabetes. From the patient's point of view it is most important to ascertain the nature of the glycosuria, for patients are not infrequently submitted to severe antidiabetic treatment when the condition is only a simple renal glycosuria. An instance of this kind came under my notice a few weeks ago, when a patient was admitted to my wards suffering from what was said to be severe diabetes. His history and certain of his symptoms were exactly what might be expected in this disease, and his urine contained both sugar and acetone. Naturally, before admission, he had to run the gauntlet of several medical men, yet on investigation he proved to be quite free from diabetes, and was as capable of utilising carbohydrate as any average subject. The sugar in his urine was accidental, and the acetone was produced by his strict protein diet in the manner to be described later on. I quote this case simply to show that it is quite impossible in certain patients to decide by clinical investigation whether they are diabetics or not. In such patients, examination of the urine gives little or no helpful information. Sugar is present, and that is all we can say. What the significance of the sugar is can only be ascertained by a blood-sugar examination. In the investigation of glycosuria we nowadays pay little attention to the urine, but devote our energies to the blood instead. By this means we obtain information which urine examination is incapable of furnishing. Indeed, it may be said with truth that examination of the urine is of comparatively little value in any doubtful case of glycosuria, and the fashion of giving long detailed analyses of various constituents, so prevalent on the continent, is devoid of value, at any rate as far as the patient is concerned. With regard to urinary examination, I have been very much struck by the fact that many medical men assume that a patient whose urine gives a slight reaction with Fehling's solution is more likely to be a diabetic subject if the urine passed is of high specific gravity. Exactly the reverse is true. It is common knowledge that the urine in bad cases of diabetes is usually of high specific gravity, but this is due entirely to the large amount of sugar in solution. In urines of high specific gravity giving but a slight sugar reaction, and therefore containing at most only a small amount of sugar, this reaction is more likely to be due to concentration than anything else. A urine showing a small amount of sugar, but of very low specific gravity, would be more suspicious. In every doubtful case of glycosuria it is essential that the patient's blood-sugar should be investigated, for when this is done, we can generally ascertain what the nature of the glycosuria is, and to what extent carbohydrate metabolism is interfered with.

Our knowledge of the changes which the blood-sugar undergoes both in normal and diabetic subjects has been obtained very largely from investigations pursued during the last few years. Much of this knowledge is therefore new, and some of it we do not yet fully understand. However, recent methods of blood-sugar investigation, by which the blood-sugar concentration can be ascertained when using only a few drops of blood, have contributed largely to a more complete understanding of the mechanism by which glycosuria is produced. It may be said at once that a knowledge of the changes which the blood-sugar undergoes as the result of food and other factors is so important that no medical man can ever have other than an empirical conception of glycosuria and the manner in which it is produced unless he is conversant with this recent knowledge. A few hours spent in mastering the somewhat elementary details connected with the subject will well repay him, for he will then understand clearly many points connected with glycosuria and diabetes which were formerly dark and obscure. For everyone who treats diabetic patients with the new remedy insulin it is imperative that these blood changes should be understood, and they will now be briefly described.

Blood-Sugar in the Normal Subject.

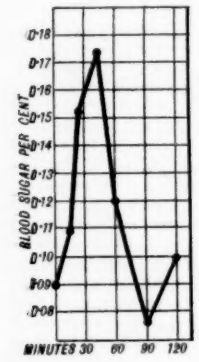
Since the blood-sugar variations in the normal individual must be appreciated before we can understand the changes found in the diabetic, it is necessary to deal first with the normal subject. In the normal healthy person the blood, when examined three or four hours after a meal or in the morning before breakfast, will be found to contain about 0·1 per cent. of sugar. This value varies to some slight extent in different individuals, but, speaking generally, it lies between 0·09 and 0·11 per cent. Under certain circumstances it may be a little higher, or even a little lower than this, but the round figure of 0·1 per cent. (100 mg. sugar per 100 c.cm. blood) is generally accepted as the normal for average individuals. Formerly there used to be an idea that blood-sugar concentration remained practically constant, and never varied to any appreciable extent, but we now know that this is an erroneous view, and that as the result of food and other factors the blood-sugar is constantly changing from time to time. These changes

are best observed when the blood-sugar is estimated at short intervals after a meal of starchy food or sugar.

Blood-Sugar Variations in the Normal Subject After Ingestion of Carbohydrate.

If we take a healthy adult and estimate his blood-sugar three or four hours after a meal it will, as already indicated, nearly always be in the region of 0·1 per cent. If we now give him, say, 50 g. of glucose by mouth, and examine his blood-sugar at half-hourly intervals, a very definite result will be obtained. Half an hour after the ingestion of the glucose, the blood-sugar will be found to be much increased, and will probably be in the neighbourhood of 0·17 per cent. A further blood-sugar estimation carried out one hour after the glucose ingestion will usually show a blood-sugar concentration much lower than the preceding one, but usually somewhat higher than the normal value. When examined one and a half hours after the ingestion of glucose, the blood-sugar will usually be found to be as low as 0·1 per cent., or sometimes even lower. Somewhat similar results are found when sugar is substituted by carbohydrate foods, such as bread, potatoes, or a mixed carbohydrate diet. After an ordinary mixed meal, the blood-sugar rises very considerably within the first half to three-quarters of an hour; it then decreases, and within one and a half to two hours after taking a meal, it once again returns to the region of the normal value. A sugar curve obtained from a normal individual is shown in Fig. 1; here 50 g. of glucose were taken.

FIG. 1.



Blood-sugar curve obtained from normal individual.

From the above short description it will be obvious that the amount of sugar found in the blood depends chiefly on the time the sample of blood is withdrawn with reference to the diet. It is very important to be quite clear on this point, for a blood-sugar of, say, 0·17 per cent. would be of no significance whatever if found shortly after a mixed meal had been taken, but would be of definite significance if found in a patient who had taken no food for several hours beforehand. Since all our ordinary diets contain a certain amount of carbohydrate, the blood-sugar concentration is constantly increasing and decreasing during each day, in correlation with our meals.

The Extent to which the Blood-Sugar can be Raised in the Normal Subject.

In the average normal individual it is practically impossible to raise the blood-sugar above 0·17 to 0·18 per cent. The exact amount varies somewhat with different individuals, and occasionally the value may lie a little higher than the figures just given, but, generally speaking, it will be found that the blood-sugar cannot be raised above a maximum of 0·2 per cent., however much starch or glucose be taken. Thus a dose of 50 g. of glucose given to a certain subject raised the blood-sugar to 0·17 per cent. after 30 minutes, while, on another occasion, in the same subject, a dose of 250 g. gave exactly the same blood-sugar value when examined at a similar interval after the dose; this was the maximum point to which the blood-sugar rose in both instances. The only difference was, that with the larger dose of glucose the high value was maintained for a slightly longer period. On both occasions the blood-sugar was 0·1 per cent. after two hours. From this it will be obvious that it is generally impossible to produce glycosuria in the normal subject by feeding with excess of sugar. Indeed, patients have taken nearly a pound of sugar at once without any glycosuria being produced. There is therefore, strictly speaking, no such condition as the so-called "alimentary glycosuria," for if glycosuria succeeds an excessive ingestion of sugar or starch, it generally indicates that the patient's mechanism for dealing with sugar is defective. No doubt, excessive amounts of sugar may occasionally induce a slight glycosuria in a healthy subject, but such doses are difficult to take, and generally produce nausea and vomiting. We may, therefore, accept it as proved that excessive ingestion of carbohydrates does not per se produce glycosuria. When very large amounts of carbohydrate are taken over long periods glycosuria may result in some subjects, but this appears to be caused by a long-continued strain on the carbohydrate storage mechanism—a strain which ultimately injures the mechanism and results in a condition which is essentially a potential diabetes, and which frequently leads to a well-marked clinical diabetes.

The Mechanism which Prevents Glycosuria After Ingestion of Sugar.

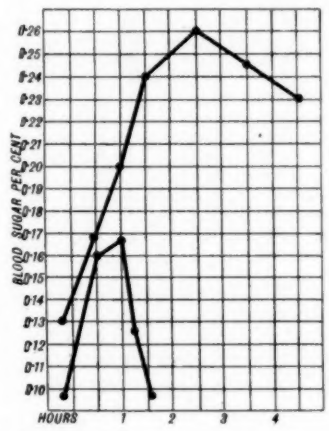
The fact that sugar taken by the mouth will not, as a rule, raise the blood-sugar beyond the limits mentioned, however much sugar is taken, suggests that there must be a definite mechanism which removes the sugar from the blood when it rises to this point. It might, of course, be argued that what happens is much simpler, and that the chief cause of the drop is lessened absorption from the intestine. That this is not so is quite certain, for it has been shown that absorption goes on steadily for a long time after the blood-sugar begins to fall; that, indeed, the blood-sugar may have returned to a normal or even subnormal value with absorption still going on rapidly all the time. The mechanism which prevents the blood-sugar rising to any appreciable extent in the normal subject probably resides in the liver. All the absorbed sugar has to pass through this organ before it gets into the general circulation, and it would appear as if the liver at first allowed a certain amount to pass through but that, whenever a concentration of about 0·18 per cent. is reached, then the liver begins to store sugar, and so removes it from the blood. It is most interesting to remember that this figure—approximately 0·18 per cent.—is *just about the maximum concentration which can be present in the blood without any sugar being removed by the kidneys.* Whenever the blood-sugar exceeds 0·18 per cent. the kidneys throw out the excess. There is thus a very definite reason why the blood-sugar should not be permitted to rise above a certain value in the blood for a high concentration of blood-sugar would simply result in a great loss of sugar by the kidney. This maximum blood-sugar value of about 0·18 per cent. is known as the *renal threshold value* for sugar, and represents the concentration below which no sugar is excreted into the urine. This renal threshold value, however, sometimes varies to some extent, even in perfectly healthy individuals, and when it is lower than normal it gives rise to the condition known as *renal glycosuria*, which will be fully described later.

Blood-Sugar Reactions in the Diabetic Subject.

When sugar is given to a diabetic patient the results obtained in the blood are very different from those in the normal individual. In the former the blood-sugar is generally higher than the normal 0·1 per cent. to begin with, but if it is reduced to this region by dieting, and then a dose of 50 g. of glucose is given, the blood-sugar rises steadily for an hour or two, the intensity of the rise being dependent on the gravity of the case. In the diabetic there is often little or no evidence of any mechanism for preventing the blood-sugar rising above the normal threshold value of approximately 0·18 per cent., and so glycosuria results. Generally, in a fairly severe case, the blood-sugar rises to 0·3 per cent. or more within one and a half hours to two hours. Here the usual mechanism is in abeyance, and in every case of diabetes the blood-sugar rises much higher than it ever does in the normal. This, however, is not the most striking

difference between the healthy and diabetic patient, for in the latter the blood-sugar fails to return for many hours or perhaps not at all, to the concentration present at the beginning of the experiment. The typical diabetic blood-sugar curve is therefore characterised by an increase of blood-sugar well above the renal threshold value, together with a very great delay in the return of the blood-sugar content to an approximately normal level. These two phenomena generally go together, but during the earlier stages of diabetes, when glycosuria is as yet only intermittent, it is found, that though the blood-sugar concentration may never exceed the normal threshold value, the curve is much prolonged. In such cases it may take three or four hours for the blood-sugar to resume its normal level after a dose of 50 g. of glucose has been taken. Indeed, it is certain that one of the earliest indications of diabetes is a prolongation of the time required for the blood-sugar to return to normal after a dose of glucose. As the malady progresses this is accompanied by a marked increase in the height ot the curve as well. The curve obtained from a moderately severe case of diabetes after the ingestion of 50 g. of glucose is given in Fig. 2. The contrast between this and the normal curve shown alongside is very striking.

FIG. 2.



Diabetic (upper) curve compared with normal (lower) curve.

Sugar-Tolerance Tests in Diabetes.

Based on the above principles, various tests have been suggested to ascertain whether or not any given case of glycosuria is really diabetic. The so-called *sugar-tolerance test* which consists in giving to a patient about 50 g. of glucose dissolved in 2 or 3 oz. of water, and then estimating the blood-sugar at half-hourly intervals for two hours, is perhaps the most satisfactory method. The patient should have no food for two or three hours beforehand, and must not eat or drink during the test. If, after taking 50 g. of glucose the blood-sugar comes back to approximately the normal value of 0·1 per cent. within two hours of taking the glucose, then the case is not one of diabetes. For various reasons it is more satisfactory to do half-hourly blood-sugar estimations in these cases, but the same information can generally be obtained by means of a single blood-sugar estimation carried out on a patient two hours after the ingestion of 50 g. of glucose. If his blood-sugar is then approximately normal he is not a diabetic. In every healthy person the blood-sugar will be found to be normal after this period. In a certain number of elderly people the fall may be delayed to some slight extent, but in young and middle-aged subjects the blood-sugar ought generally to be back to normal in one and a half hours. It is this return to normal within a certain period that is most important in the interpretation of sugar-tolerance tests, though the maximum extent to which the sugar concentration rises in the blood also gives a good deal of information.

The Relation of Blood-Sugar to Glycosuria.

It will now be obvious that when glycosuria occurs the blood-sugar must be higher than 0·18 per cent.; whenever it gets to even a slightly lower level than this glycosuria at once ceases. The absence of sugar in the urine, therefore, does not tell us whether the blood-sugar is subnormal or nearly as high as 0·18 per cent. What we do know is, that in people with normal kidneys, glycosuria cannot occur unless the blood-sugar is at least as high as 0·18 per cent. or rather more. It will thus be seen that there is not necessarily any essential virtue in keeping the urine just free from sugar, for in one patient with 0·19 per cent. blood-sugar, glycosuria might be present, while in another patient with, say, 0·18 per cent. blood-sugar, no glycosuria would be seen. The border line, so to speak, is a narrow one. This point is frequently forgotten in connexion with the treatment of diabetes, but it shows the advantage of blood-sugar estimations whenever these can be carried out. In some patients, and more especially in elderly individuals, the renal threshold value for sugar may be very considerably raised, so that even 0·3 per cent. or more sugar may be present in the blood without any glycosuria. In such patients urine examination is most deceptive, and effective control can only be exercised by means of blood-sugar investigations. A few examples of the results of sugar-tolerance tests in diabetic patients are given in Table I.

TABLE I.—*Blood-Sugar Before and After Glucose.*

Case.	Before.	Half hour after.	One hour after.	Two hours after.
1	0·124	0·193	0·281	0·245
2	0·162	0·235	0·321	0·290
3	0·120	0·192	0·224	0·162
4	0·320	0·451	0·426	0·391

RENAL GLYCOSURIA.

Though the normal average kidney does not permit of the passage of sugar until a concentration of over 0·18 per cent. is reached in the blood, there are many individuals whose kidneys will allow sugar to pass when the blood concentration is much lower than this. Since the blood-sugar always rises after a mixed meal, it is obvious that these subjects will tend to pass sugar after every meal. Instead of the normal threshold value, these patients may have a threshold value represented by any blood-sugar concentration between 0·1 or less and 0·18; obviously, glycosuria is a necessary feature of this condition. Renal glycosuria means simply that the kidneys allow sugar to pass through into the urine at a level of blood-sugar concentration that is much lower than usual; this blood-sugar concentration, however, is always within physiological limits, so that the only organs participating in the production of this condition are the kidneys. A similar condition can be induced experimentally by giving phloridzin. In this case, large amounts of sugar are passed in the urine, but, on examination, the blood-sugar will be found to be very low. A somewhat similar phenomenon is also very common during the first few months of pregnancy, the glycosuria so frequently encountered through this period being dependent on a temporary lowering of the renal threshold.

In these renal cases the sugar-tolerance curve is quite typical, for the highest point reached never exceeds the normal threshold value, and frequently the rise is very much less than normal. This results from the fact that sugar, which will normally accumulate in the blood and so raise the blood-sugar concentration, is thrown out in the urine. In other respects the curve behaves just as the normal does. After taking 50 g. of sugar by mouth the blood-sugar returns to the normal level in from one and a half to two hours or perhaps earlier, and the glycosuria then ceases. The mechanism of renal glycosuria is a simple one to understand, though the exact condition in the kidney which causes it is at present obscure. The amount of sugar passed in the urine in such cases depends principally on the exact concentration at which the kidneys begin to throw out sugar. Other things being equal, the lower this blood-sugar concentration, the more sugar will be excreted. There is no advantage to be

gained in endeavouring to divide renal glycosuria into different types, for this only tends to confuse a perfectly straightforward issue; there is, indeed, no essential difference between one case of renal glycosuria and another, except in so much as the excretion of sugar depends on what the level of the renal threshold happens to be in any particular patient. The figures given in Table II. show the results obtained by sugar-tolerance tests in some cases of this nature; in each instance 50 g. of glucose were given.

TABLE II.

Patient	1	2	3	4	5
Blood-sugar per cent. before taking glucose ..	0·091	0·108	0·116	0·123	0·100
After ½ hour	0·132	0·176	0·168	0·187	0·142
,, 1 ,, ...	0·112	0·112	0·131	0·167	0·106
,, 1½ hours	0·084	0·109	0·090	0·121	0·091
Urine-sugar per cent.—					
Before test	0·25	0·30	—	0·70	Traces
After test	2·1	3·5	0·6	1·3	2·2

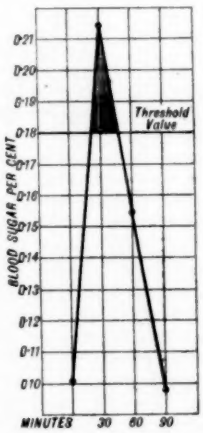
It will be quite obvious that so-called renal glycosuria has nothing whatever to do with diabetes. That the condition is quite harmless seems to be proved by the fact that several patients have been examined, who are known to have had glycosuria for many years. The slight loss of carbohydrate may be a disadvantage, but practically this is never so great as to be of much importance. It is possible, of course, for a diabetic to have a lowered renal threshold, but such a condition is rare, though I have seen two cases of this nature. In contrast with the general impression at present prevailing, renal glycosuria is by no means a rare condition, and many patients now being treated as diabetics are suffering from nothing more serious than this complaint. Within the last four years I have examined more than 100 patients suffering from renal glycosuria. In not a few instances these patients were supposed to be diabetic and were being treated accordingly. The condition is frequently a familial one and may be sometimes traced back for several generations. It may occur in several members of the same family. As an indication of the great frequency of renal glycosuria I might state that it is now our custom at St. Thomas's Hospital to get all the students to carry out sugar-tolerance tests on themselves before allowing them to investigate patients. In every class we have had during the last few years we found from one to three students suffering from renal glycosuria. In addressing medical men on glycosuria it has nearly always been my experience that at least one doctor approached me after the lecture to tell me that he himself suffered from the condition. The glycosuria which is so frequently discovered accidentally during a life insurance or other medical examination is frequently found to be of renal origin, but in order to ascertain definitely what any glycosuria indicates, it is necessary to examine the blood and to carry out a sugar-tolerance test. Without exception such a test will settle the matter as far as renal glycosuria is concerned.

Another Mechanism in the Production of Glycosuria.

In some patients whose power of dealing with carbohydrate is quite efficient, glycosuria, other than that of renal origin above described, may occasionally be present. When a sugar-tolerance test is carried out on such patients it will be found that the blood-sugar rises considerably higher than the normal threshold value, and in this way simulates an ordinary diabetic curve. Instead, however, of remaining high, the blood-sugar quickly falls, and in one and a half hours or so reaches the normal level. Unlike what happens in diabetes, there is no difficulty whatever in removing the sugar from the blood once the sugar storage mechanism gets into play, but this mechanism appears to be delayed, so that the blood-sugar is allowed to rise above the threshold value for a short period, with the result that glycosuria follows. The very nature of the curve obtained (see Fig. 3) is an indication that carbohydrate metabolism is quite efficient, since the curve is not in the least prolonged. The exact significance of this condition is at present not understood, but it does not seem to be in any way prejudicial to the patient.

The condition is not of common occurrence, but is rather puzzling when met with. In my monograph on diabetes I have applied the term "lag" to a typical curve of this nature, on the assumption that the phenomenon is due to a delayed activity on the part of the sugar storage mechanism.

FIG. 3.



A typical "lag" curve.

Some General Observations on Glycosuria.

Although the typical curve obtained by testing a diabetic patient by the sugar-tolerance test is a high, and especially a prolonged one, various conditions, other than diabetes, will in some measure produce the same type of curve. In practice it is found that one prolific source of glycosuria is immoderate use of alcohol. Alcohol apparently acts on the liver and tends to deplete the glycogen reserve, so that it is by no means uncommon to find sugar in the urine after a dinner in which alcohol plays a part. The effect of emotional disturbances and excitement in producing glycosuria is now well recognised. Possibly the glycosuria sometimes found during the medical examination of a patient may be nothing more than an indication of mental excitement and nervousness. Certain drugs also will produce glycosuria, especially thyroid extract, and the occurrence of glycosuria in endocrine disorders is familiar to all. In any case of glycosuria the medical man should attempt to elucidate such possible factors as those mentioned. Frequently he will have his reward, for by eliminating the ætiological factor, the glycosuria will disappear. In general it must be remembered that glycosuria, like albuminuria, may be an important feature, or it may be of no significance; it bears roughly the same relation to diabetes as albuminuria does to nephritis. Glycosuria is relatively common, while diabetes is, on the whole, a comparatively rare disease. This must mean that glycosuria has no essential relationship to diabetes, just as albuminuria is no definite indication of the presence of nephritis. Both conditions, when found, should be regarded as possibly important symptoms, but in neither case should the medical attendant rest content until he has done all he can to elucidate the cause. On finding glycosuria in a patient showing no definite symptoms of diabetes, a sugar-tolerance test is always indicated. Were this more frequently carried out many patients with glycosuria would be found to possess quite good powers in metabolising carbohydrate, and frequently the patient could be assured that his glycosuria would do him no harm. If, on the other hand, the result of such a test should suggest the presence of an early diabetes, prompt and efficient treatment gives the best chance to the patient. We can no longer rely on examination of the urine in such cases, and if we wish to get the best result we must have recourse to blood examination.

The Estimation of Blood-Sugar.

Since the introduction of the insulin treatment for diabetes, it is more than ever necessary that medical men should be able to carry out blood-sugar estimations. This will be referred to later when dealing with insulin. For the present, sufficient has been said as to the value of such investigations in all cases of glycos-

uria, and the only question that arises is whether it is possible for the average medical practitioner to estimate the blood-sugar. It is quite true that many of the methods used for this purpose are elaborate, and quite unsuitable for anyone who has not a well-equipped laboratory at his disposal. Many of these methods necessitate the use of a colorimeter, and experience shows that colorimetric methods, while excellent in the hands of the trained observer working in a laboratory, are unsatisfactory for the general practitioner. Another objection to their use is the costly nature of the apparatus. For general use the apparatus must not be expensive, and the method must be simple and reliable. The writer has worked out a method[1] for the estimation of blood-sugar which can be performed by any medical man possessing the minimum of chemical knowledge and laboratory equipment, provided he has a little time at his disposal. The ease with which this method can be carried out with satisfactory results is obvious from the fact that our students, when doing it for the first time, almost invariably get correct results. In a class of 25 students or so carrying out observations on themselves the results generally vary from 0·09 to 0·12 per cent.—numbers which represent the ordinary blood-sugar values. The apparatus necessary may be obtained for a few pounds, and it is doubtful whether a simpler method can be evolved. Its accuracy has been amply substantiated both at home and abroad and the method is now in general use in many institutions in this country. It is also being used with success by several medical men in general practice; even when done roughly it will give results sufficiently accurate for clinical purposes.

TREATMENT OF DIABETES.

As soon as the diagnosis of diabetes is definitely established, we should begin treatment at once. Before the modern insulin treatment came into vogue we had to rely almost entirely on dietetic means, for no drug possesses the slightest beneficial influence on the condition. Contrary to a widespread belief, dietetic restrictions are just as essential when insulin is used as ever before, and it is important that the principles of modern dietetic treatment should be utilised in conjunction with the insulin treatment. For this reason a few points on diet in diabetes will be very shortly discussed here.

The dietetic treatment in vogue at present is associated with the name of Allen, and despite many claims by various observers it must be admitted that to Allen alone belongs the credit of having introduced more rational measures in dieting diabetic patients. The merit of Allen's work lies essentially in the fact that he alone brought forward experimental evidence for his conclusions. Allen removed the greater part of the pancreas from dogs, leaving behind a small portion of the organ intact. He found that the ultimate fate of such dogs depended on the diet. When a dog with a very small amount of pancreas was fed on a high diet, whether of carbohydrate or protein or fat, it gradually began to pass sugar in the urine, and soon developed all the symptoms of typical diabetes, with the result that death from coma took place. Such a dog, when fed on a low diet, maintained good health and showed no signs of diabetes. It thus became obvious that in the case of partially depancreatised dogs, the best way to maintain health was to give the lowest possible diet for the needs of the animal. Unfortunately, the condition of a dog with a small but healthy part of his pancreas left is essentially different from that of a person suffering from diabetes. In the latter case the disease is dependent on some change entirely different from the experimental removal of part of the pancreas, and is essentially progressive, otherwise the disease would never have manifested itself. That this progressive tendency can be accelerated by unsuitable diet is certain, but the point to remember is that in human diabetes two factors are present: (1) An essentially progressive lesion absent in experimental animals; and (2) the detrimental effect of improper diet.

If the tendency to progression of the disease is very marked, dietetic treatment will not prove very satisfactory, but if, as frequently appears to be the case, this factor is not a very active one, then dietetic treatment will give excellent results. Consideration of these points will help us to understand why modern dietetic treatment alone frequently leads to disappointment. In such cases insulin gives wonderful results, and this is the type of case in which insulin will be most beneficial.

Some Principles of Modern Dietetic Treatment.

Briefly stated, modern dietetic treatment of diabetes consists in giving to the patient the minimum amount of food which will enable him to keep fairly fit and free from glycosuria, and, if possible, from acetonuria. To do this it is necessary to ascertain what amounts of the three ordinary classes of foodstuffs—carbohydrates, proteins, and fats—should be present in the diet. The subject is fully discussed in my monograph on Diabetes and Glycosuria, but the principles on which the diet should be built up will be referred to here very shortly.

The Building up of a Suitable Diet.

The first point to be considered is, What is the necessary minimum amount of food that would be required as a permanent diet for any given patient? It is now the custom to express food values in terms of calories, and for clinical purposes it is sufficiently accurate to assume that 1 g. carbohydrate = 4 calories; 1 g. protein = 4 calories; 1 g. fat = 9 calories. The total number of calories necessary for any given patient is calculated from the fact that for every pound of weight he will require roughly from 12 to 15 calories. Thus, a man weighing 140 pounds would require, as a minimum, from 1700 to 2000 calories, and in ordinary life would probably eat sufficient to give a good deal more than this. When the patient is leading a very sedentary life, he can sometimes get on fairly well with even less than the above minimum. Having ascertained the number of calories necessary, it is now essential to decide what amounts of the different classes of foodstuffs should be given to make up the requisite calories.

Amount of Protein Necessary.

Whatever the nature of the diet, it is necessary to give some protein, and experience shows that the minimum amount of protein necessary for health is about one-half a gramme per day for each pound the patient weighs. In a patient weighing 140 pounds it will therefore be necessary that his permanent diet should contain at least about 70 g. of protein.

Amounts of Carbohydrate and Fat Necessary.

It is very rare to find a diabetic patient who can take more than 80 to 100 g. of carbohydrate per day without passing sugar, and the great majority of severe cases can generally utilise not more than half of this amount. Some patients, indeed, can take only a very few grammes of carbohydrate per day. The exact amount suitable for each individual patient is ascertained by the usual well-known method of starving the patient until the urine is sugar-free, and then giving a series of diets containing increasing graduated amounts of all three foodstuffs. When sugar appears in the urine it may be assumed that the amount of carbohydrate contained in that particular diet is roughly the maximum which the patient can assimilate, and it is well to give rather less than this amount. For a permanent diet, the remaining calories must be made up from fat. For example, a patient weighing 140 pounds and therefore requiring a diet containing at least about 1700 calories, was found to pass sugar when on a diet consisting of 40 g. of protein and 40 g. of carbohydrate together with some fat. This patient's protein was ultimately increased to 70 g., and with

[1] For a complete description of this method see my monograph, "Modern Methods in the Diagnosis and Treatment of Glycosuria and Diabetes," 1922 (Constable and Co., Orange-street, London). Many of the points referred to in this paper are more fully discussed in this book.

this 30 g. of carbohydrate were allowed, the necessary calories being made up by giving 150 g. of fat.

Food Values.

Many books dealing with food values are now obtainable, but for practical purposes I have found the following tables to be most useful; indeed, little more is required for the treatment of diabetes. As they may prove helpful to the general medical man I give them here. By their use a suitable diet can be made out for almost any patient.

TABLE III.—*Showing Carbohydrate Content of Various Vegetables and Fruits.*

Group.	ONE OUNCE CONTAINS—	
A	1 g. ch.	Cabbage, cauliflower, Brussels sprouts, lettuce, spinach, cucumbers, asparagus, marrow, rhubarb, celery, mushrooms, tomatoes, watercress, seakale, leeks, radishes, grape fruit, endive.
B	2 ,,	Carrots, onions, turnips, beets, French beans.
C	3 ,,	Oranges, strawberries, gooseberries, cranberries, peaches, pineapple, water melon.
D	4 ,,	Green peas, artichokes, parsnips, pears, apples, currants, cherries, raspberries, apricots.
E	6 ,,	Potatoes, plums, prunes, bananas.

g.ch.=grammes carbohydrate.

TABLE IV.—*Showing Approximate Content in Grammes of Protein, Fat, and Carbohydrate in* ONE OUNCE *of Foods.*

—	Carbohydrate.	Protein.	Fat.	Calories.
Bread (brown)	13	1·2	0	65
Bread (white)	15	2	0	75
Butter	0	0	23	212
Broth	0	1	0	5
Bacon	0	3	18	180
Cream (thin)	1	1	6	65
Cream (thick)	1	1	20	190
Chicken	0	6	1	34
Cheese	0	8	10	130
One egg	0	6	6	80
Fish (cod, whiting, haddock)	0	5	0	20
Meat (lean)	0	6	3	51
Milk	1·5	1	1	19
Margarine	0	0	23	212
Oatmeal (dry weight)	18	4	2	112
Potato	6	0·5	0	30
Shredded wheat	21	3	0	103

THE INSULIN TREATMENT OF DIABETES.

Insulin is a substance of unknown nature derived from the islands of Langerhans in the pancreas. The method of preparation of this product is somewhat tedious and laborious, but the principle of its isolation depends on a process of fractional precipitation with alcohol. By this means certain deleterious and irritating substances are left behind, and the insulin ultimately obtained in a form more or less suitable for clinical purposes. Various methods of purification of crude insulin are employed, and it may be said at once that the substance can now be prepared in such a state of purity that no local reactions follow its use. *Insulin must be given hypodermically*, and is of no value when given by mouth. In this connexion it is safe to assert that none of the pancreatic preparations given by mouth have any beneficial effect on diabetes, whatever other action they may possess. In the preparation of insulin great care has to be exercised to ensure that the product is sterile, for it is obvious that contamination of the ox pancreas, from which the insulin is prepared, by intestinal contents, might result in infecting the patient. All these difficulties, however, have been overcome and quite reliable insulin is now being prepared commercially. In this connexion the thanks of the community are due to the Medical Research Council, who took steps to control and promote the manufacture of insulin in this country, with the result that the samples now being made here are reliable in strength and action. Were it not for the measures taken by the Medical Research Council it is probable that the country would now be flooded with useless preparations, and an excellent remedy might have fallen into disrepute.

Dosage of Insulin.

The strength of insulin preparations is at present ascertained by means of rabbit experiments. The amount of insulin required to bring the blood-sugar of a large starved rabbit to about 0·04 per cent. in two hours or so is taken as the basis of unitage. Generally, when the blood-sugar reaches this level, the animal goes into convulsions. These can be stopped by the introduction of sugar into the rabbit's stomach by a tube or by injection into the system. The amount of insulin required to produce the above effects in a rabbit is equivalent to about three units, according to the new nomenclature, and an ordinary minimum human dose is taken as representing three to four times this amount, or about 10 units. In many patients, of course, much larger doses may be given with impunity. Unfortunately, different rabbits vary very much in their response to insulin, so that the method of standardisation just described is not a very accurate one. Patients also vary to a great extent. It is important to have all insulin preparations standardised as carefully as possible, so that the different samples on the market may all have approximately the same strength. On the other hand, extreme accuracy is at present impossible, and however desirable scientifically, is not essential for the clinical use of insulin. Indeed, the present standardisation seems quite efficient for all practical purposes.

Some Symptoms Produced by Insulin.

Insulin is a powerful remedy, and in the hands of the inexperienced may give rise to certain difficulties. When an overdose is given, the patient frequently complains of certain curious symptoms which generally come on from an hour to a few hours after the injection. These symptoms consist of flushing, giddiness, local sweating, a sense of constriction about the chest and abdomen, collapse, and other manifestations; if this condition is unrelieved convulsions may follow. These symptoms appear to be of nervous origin, and are dependent on the fact that the central nervous system requires its nutrient blood to contain a certain amount of sugar. When, as the result of the action of insulin, the blood-sugar sinks to the neighbourhood of 0·04 per cent., the above symptoms ensue, and convulsions may set in. Addition of sugar to the depleted blood will at once remove all symptoms, so that there is little or no real danger if the patient is carefully warned to take sugar by mouth whenever any symptoms, such as those described, follow the injection of insulin. Sugar, when given by mouth, reaches the blood in a very short time, but it may, of course, be necessary to inject sugar intravenously in the case of an unconscious patient.

Effect of Insulin on the Diabetic Condition.

Insulin acts in tending to restore the diabetic patient to the condition of the normal individual. Apparently, in diabetes, a substance essential for carbohydrate metabolism is missing or present in insufficient amount, and the injection of insulin supplies this missing secretion. Consequently, in diabetes the therapeutic use of insulin results in a disappearance or lowering of the urinary sugar and ketone bodies. In subjects whose diets are carefully correlated with the insulin dosage, the blood-sugar may be kept within normal limits, and the urine free from sugar and ketone bodies. Very careful adjustment of diet to insulin is, however, required to produce this effect and frequent estimations of blood-sugar may be essential. It may be taken as a general rule that insulin will produce no deleterious effects as long as glycosuria is present, so that it is easy and safe to regulate the dosage by examining the urine. When sufficient insulin is given to render the urine sugar-free, the condition of the urine does not help us any more, and recourse must be had to blood-sugar examinations. Indeed, blood-sugar estimations are

almost essential in treating patients with insulin, but as circumstances might arise in which they could not possibly be done, it may be helpful to state that they are not absolutely necessary in all cases. Without the means of ascertaining the blood-sugar content, it is true that one is, to some extent, working in the dark, and it is to be hoped that every practitioner using insulin will make himself efficient in performing this comparatively simple manipulation. To begin with, however, this ideal result may not be easily reached, and as it is most important to prevent the occurrence of possible tragedies at this stage of the treatment, the following rules, based on my own experience of the remedy, may be found helpful in the treatment of patients. Many modifications of these suggestions may be made and they are only given as a general outline.

Rules for Treatment of Patients with Insulin.

1. Always make quite certain that the case is really one of diabetes. It is somewhat dangerous to treat certain cases, such as the renal glycosuria already described with insulin, since the blood-sugar in these may be already somewhat low. To exclude renal glycosuria give the patient a dose of glucose or ordinary cane-sugar (50 grammes) and get him to empty his bladder two and a half to three hours after the ingestion of the glucose; test the next specimen of urine passed for sugar. If sugar is then absent, or only a small amount is present, the case is not suitable for insulin, since the glycosuria is probably of renal origin. Also examine the urine for acetone and diacetic acid. If acetone is not present, the patient does not require insulin. Here it should be noted that acetone may be present in the urine of any patient if his diet has been recently changed to one containing a good deal of protein and fat and little carbohydrate. If possible, do a blood-sugar estimation, when the exact state of matters will be more or less obvious. Inquire carefully into the history of the patient and ascertain whether he has lost weight, and whether well-marked symptoms of diabetes are present. If he has not been dieted before, and is found to be suffering from diabetes, try the effect of diet before giving insulin; in such cases insulin may be used with advantage instead of the old starvation treatment, to bring the blood-sugar back to normal, at the early stages of treatment. When this happens insulin should be stopped, and, gradually, diets on the lines already described given. When a patient is doing fairly well on diet insulin should not be given.

2. Having decided that the patient is a suitable case for insulin, it is necessary to arrange matters so that he may be under observation. Give him a diet containing the necessary amount of calories for his weight, or rather somewhat less than this, and let the diet always contain from 30 to 40 grammes of carbohydrate. Divide the diet into two large meals in which practically all the carbohydrate is taken, and two small meals containing little or no carbohydrate and only a few calories. Warn the patient carefully that symptoms may possibly come on after the insulin injections, and tell him to eat a few sticks of barley-sugar (½ to 1 ounce) if these symptoms do come on. To provide against delay in taking sugar under these conditions, see that the patient has always a small stock of barley-sugar or other suitable preparation on his person.

3. Begin the treatment by injecting 10 units of insulin twice a day, 20 to 30 minutes before the large meals. Collect the 24 hours' urine and examine it for sugar. Continue this dosage for three days, when, if the urine still contains sugar, 15 units of insulin may be injected twice a day instead of 10 units. If after three more days of this treatment glycosuria still persists, the dose may be increased to 20 units in the morning followed by 15 units in the evening. If glycosuria persists after a few days of this dosage, give 20 units twice a day. If glycosuria now disappears, the dose is approximately correct for the diet, but unless facilities for blood-sugar estimation are available, it might now be safer to revert to a dose of 15 units in the morning followed by 15 units at night. This may be continued for a long period, but the same diet must be carefully adhered to. If the diet is deemed insufficient, a little more carbohydrate may be added to the two larger diets, and if this produces glycosuria the dose of insulin may be gradually increased in order to ascertain what amount will result in a urine with just a very small amount of sugar. If at all possible control the treatment from time to time with blood-sugar estimations. Unless this can be done, a dose of 20 units twice daily should perhaps not be exceeded, or, at any rate, should only be increased very carefully and gradually. The diet and insulin dosage of one of my cases is recorded below. The patient, a young adult, was suffering from the effects of severe and long-continued diabetes. On the régime given he is free from glycosuria, and shows only very slight acetonuria. He feels quite fit and is doing fairly heavy manual work.

Régime for Adult Patient Doing Fair Amount of Manual Work.

9.30 A.M.: *Injection of 20 Units Insulin.*

	Carb.	Prot.	Fat.	Cal.
BREAKFAST.				
9.45 to 10 A.M.:—				
½ oz. oatmeal as porridge 1 egg 2 oz. bacon ½ oz. white bread ½ oz. butter 4 oz. vegetables (Group A) ½ oz. olive oil	25	16	70	794
1 P.M.:— **LUNCH.**				
1 egg 1 oz. cheese ½ oz. butter 2 Callard's bran biscuits 4 oz. vegetables	4	14	28	324
3.30 P.M.:— **TEA.**				
Tea with ½ oz. cream 1 Callard's bran biscuit ½ oz. butter	1	1	14	134
5.30: *Injection of 15 Units Insulin.*				
6 P.M.:— **DINNER.**				
5 oz. meat 4 oz. fish 1½ oz. white bread 1 oz. butter 4 oz. vegetables ½ oz. olive oil	26	53	52	784
Total	56	84	164	2036

With any of these diets the patient may take tea, coffee, or beef-tea in as large a quantity as desired.

THE VALUE OF INSULIN AND THE GENERAL OUTLOOK.

I have now treated nearly 20 patients suffering from severe diabetes and in every case with entirely satisfactory results. No untoward symptoms of any kind occurred in any case. Patients who were almost moribund a few months ago are now back at work, and three subjects who were first seen while in a state of diabetic coma are now quite fit. There can, therefore, be no question of the great value of the remedy. Its principal drawbacks are that it does not cure, but merely alleviates the condition while it is being given, and the fact that it has to be administered hypodermically. No doubt, in comparatively recent acute cases, its use may occasionally result in a return of tolerance, just as was sometimes the case with dietetic treatment, and I have seen one case of this kind, but it is impossible to say whether the same result could not have been achieved by diet. Since, however, this boy was actually in coma when I first saw him, insulin was naturally used. He is now taking quite a large diet with one single small dose of 5 units of insulin per day, and is apparently normal with a resting blood-sugar of about 0·1 per cent. and no glycosuria or ketosis. In long-established disease I have seen no signs of increase of tolerance after insulin, and should doubt whether, in such cases, much is to be hoped for in this direction. What exactly the future of insulin will be it is impossible to say. That its advent has provided the greatest therapeutic measure in the treatment of diabetes is certain. Probably many patients will ultimately learn to inject themselves, or make some arrangement for a friend to do this for them. Insulin is almost exactly on the same footing as thyroid extract in the treatment of myxœdema, with the disadvantage that insulin cannot be taken by mouth. That it is capable of eliminating the symptoms of diabetes and restoring strength and energy to the unfortunate sufferer is now definitely established.

SOME GENERAL OBSERVATIONS.

The suggestions given for the use of insulin may be modified almost indefinitely, but the principle of correlating diet to insulin dosage must always be observed. *If the rules given are carefully adhered to,* it would seem that there is no great danger in the use of the remedy. *Care must, of course, be taken that the patient is not allowed to fast too long after the injection,* but this is an obvious point.

One of the most striking features of insulin treatment is the rapidity with which patients put on weight; it is no uncommon occurrence for them to gain a stone in about ten days. Also, in many cases, the ketosis rapidly diminishes, even though fairly considerable amounts of sugar may persist in the urine. Unpleasant symptoms are much more easily produced by insulin in the case of mild diabetes than in the severer types. In my experience, long-standing cases with much wasting and passing very large amounts of sugar and ketone bodies are not likely to show untoward results even when fairly large doses of insulin are given. Such cases frequently stand insulin well. In short, the worse the case the less dangerous does it appear to be to give large doses of insulin. In this respect, it must be observed that many apparently severe cases are really not of a severe nature at all, and often respond very readily to diet. The inexperienced observer might take this condition for a very severe type, but a little care will show that such cases are almost invariably of short duration, and are frequently suffering chiefly from the effects of unsuitable diet. If the case is a long-standing one with severe symptoms and marked glycosuria, insulin may frequently be used with impunity in larger doses than above suggested, but the usual precautions must be taken and graduated doses given at first. With regard to the part played by insulin in the treatment of diabetic coma, it would appear that if the patient is treated before the symptoms become too intense recovery is the rule. Here it is advisable to inject immediately at least 20 units of insulin; this may be followed by another 20 units in a short time if the symptoms do not improve. The usual treatment of diabetic coma, consisting of the administration of large amounts of fluid either by mouth, intravenously, or subcutaneously, together with attention to the bowels, and the other usual procedures should be combined with the insulin treatment. Insulin may be a most dangerous remedy if great care is not taken in its use, but if the dosage given is not large enough to render the urine sugar-free, and if the most strict precautions to ensure that the patient always gets food containing carbohydrate shortly after each dose are taken, then, as far as my experience goes, the remedy would appear to be a safe one.

ON THE MODE OF ACTION OF VITAMINS.

BY W. CRAMER, D.SC. EDIN., PH.D. BERL., M.R.C.S.

(From the Laboratories of the Imperial Cancer Research Fund.)

IN order to understand the mode of action of vitamins it is necessary to go behind the alterations in growth resulting from vitamin deficiencies. The growth of a highly differentiated animal is affected by so many different intrinsic factors—such as digestive disturbances, infections, and toxæmias, which need not necessarily be virulent and obvious, and alterations in the endocrine organs—that one is not entitled to correlate variations in growth directly with food factors by postulating that these food factors are essential for the general biological process of cell growth, as is done in the case of vitamins, without having excluded the existence of definite pathological lesions which would account for the arrest of growth and for the decline of the animal.

In previous papers[1] my collaborators and I have tried to place the conditions produced by deficiency of vitamins on a pathological basis by correlating the general conditions produced with definite pathological lesions in specific tissues. Thus, we attributed the general marasmus and fall of temperature which occurs when vitamin B is withheld to the atrophy of the lymphoid tissue which then develops. We adduced evidence that in the absence of an actively functioning lymphoid tissue the absorption and assimilation of food from the intestine is impaired. We found conclusive proof of this view in the fact that when atrophy of the lymphoid tissue is produced by radiation, the same general effect is produced—namely, marasmus and fall of body temperature. We pointed out, further, that it was not only unnecessary to postulate for the vitamins some vague general action which could not be defined, or to assume that the presence of vitamins is necessary for the life of every cell in the body, but that such assumptions were not in accordance with observed facts. We were able also to show[2] that the assumption inferred in the current conception of the mode of action of vitamins, that these substances have no positive action, was incorrect; an immediate stimulating effect on the processes of food absorption from the intestine could be demonstrated as occurring in perfectly normal animals which had never been subjected to any dietetic deficiency. Here, again, the immediate effect of vitamin deficiency was identical with the effect produced by small doses of radiation. The increased susceptibility to certain types of avirulent infections, which is the characteristic of animals subjected to deficiency in the fat-soluble vitamin A, was found by us always to be associated with a great diminution in the number of platelets. Again, this effect could be produced by exposure to radiation in doses larger than those necessary to produce a lymphopenia, and such radiated animals showed an increased susceptibility to infections.

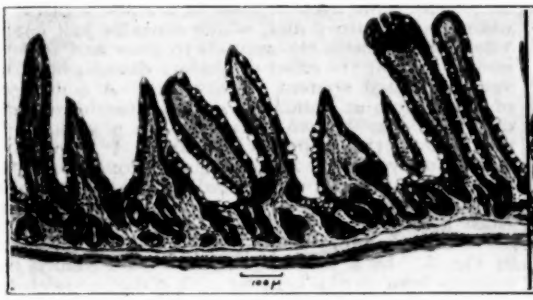
Intestinal Lesions in Vitamin-A Deficiency.

In searching for the origin of these infections we were guided by the observation that the infections are almost always due to avirulent bacteria, and that the blood or the lymph glands are sometimes found to be infected even when there is no obvious external lesion, such as xerophthalmia. In examining the intestinal tract for changes which might be the starting-point of such infections we have found very definite lesions which are illustrated in the accompanying figures. The sections are longitudinal sections and are always taken from the same place—i.e., the lower end of the small intestine, two inches upwards from the cæcum. This site was selected because any change that does occur appears to be most pronounced in that region. Fig. 1 is the typical appearance of the mucous membrane of rats which have since birth been fed on a vitamin-rich diet. Fig. 2 represents the appearance of the mucous membrane of a rat which had been kept on our ordinary laboratory diet of bread and water, maize, and rice. Such a diet, as stated in a previous paper, enables the rats to grow and breed, but they grow more slowly than the rats kept on a vitamin-rich diet, and succumb more quickly when vitamin A is withheld. We have described the effect of such a diet as "vitamin-underfeeding." Fig. 3 is from a rat which has been kept on a vitamin-A free diet for five weeks and was just beginning to develop xerophthalmia. It shows profound atrophy of the villi and necrosis of the upper parts of many of the villi. Fig. 4 is from a rat in an advanced stage of B deficiency; it had been kept for four weeks on the basal ration plus cod-liver oil, and had a temperature below 35° C. The villi, although differing in appearance from the normal, show no atrophy and no necrosis.

In addition to these gross changes an abundance of protozoa, mainly *Giardia intestinalis* (*Lamblia intestinalis*), are found in the lumen of the intestine of rats in advanced vitamin-A deficiency. These are probably normally present in the intestine in small numbers, but the absence of vitamin A enables them to proliferate rapidly, and to penetrate down between the villi, where normally they are never present. This fact may be of importance in determining the pathogenicity of certain organisms; they may be non-pathogenic on one diet and become pathogenic by variation of the diet. It may also be of use in the experimental infection of animals with such organisms. The intestinal bacteria also appear to be present in

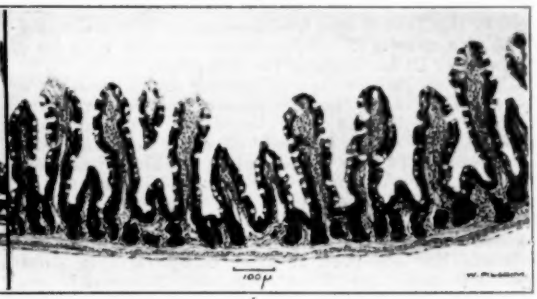
larger numbers than normally, and—what is more significant—can often be seen adherent to the villi, especially the necrotic tips; while normally the bacteria remain confined to the central lumen. A very striking effect seen frequently in the cæcum is illustrated in Fig. 5. In the cæcum the bacteria often invade the mucous glands and are found in dense masses filling the lumen of the gland right down to the bottom. In normal rats such a condition may occur exceptionally in a few glands, but in a rat suffering from A deficiency this is the rule, and affects a great many of the glands of the cæcum. The figu:

FIG. 1.



Small intestine of rat (longitudinal section) kept on a vitamin-rich diet. Rat No. 523 (see Fig. 6). Fixed in formol saline (× 60).

FIG. 2.

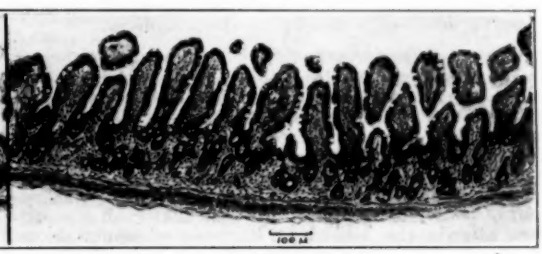


Small intestine of rat (longitudinal section) kept on the ordinary laboratory diet. Rat No. 511 (see Fig. 6). Shows the effect of vitamin underfeeding as compared with Fig. 1. Formol saline (× 60).

FIG. 3.

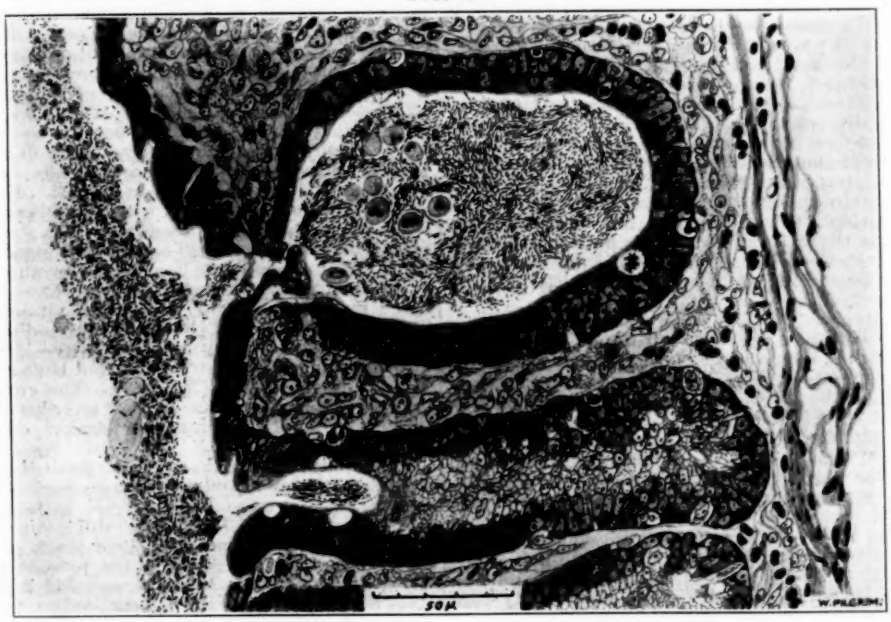
Small intestine of rat (longitudinal section) kept on a diet free from vitamin A for five weeks. Rat 529. Formol saline (× 60).

FIG. 4.



Small intestine of rat (longitudinal section) kept on a diet free from vitamin B for four weeks. Rat 554. Formol saline (× 60).

FIG. 5.



Mucous glands of cæcum of rat kept on a diet free from vitamin A. Rat 529 (same rat as Fig. 3). Formol saline (× 410). Stained with Murray's Nile-blue—van Gieson method for bacteria, which are seen filling the lumen of the glands. Note cell division in wall of distended gland.

shows a gland which is actually distended by a mass of bacteria in addition to a few round bodies, probably encysted protozoa. The neighbouring gland, of which only the opening is shown in the drawing, is also invaded by bacteria but not distended. Cestodes, also, are present much more frequently in rats kept on a vitamin-free or vitamin-restricted diet than in rats on a vitamin-rich diet. Rohdenburg and Bullock showed that the cysticerci of *Tænia crassicollis* which form in the liver of rats lead frequently to the development of a sarcoma. Here, again, the diet may be of importance in facilitating the infection.

This intestinal lesion is a further demonstration of the application of the law already referred to, that vitamin deficiencies and exposure to radiations produce the same general effects. For extensive degeneration of the intestinal epithelium has been described by Whipple and his collaborators[3] as occurring after exposure to large doses of X rays. It was also observed by Lazarus-Barlow[4] after exposure to a very large amount of radium, and Mottram has observed it after comparatively small doses of radiation from radium. Mottram[5] also noticed the proliferation of protozoa and the invasion of the glands of the cæcum by bacteria; he is inclined to attribute the lesion to a disturbance in the secretion of mucus. This effect probably explains the almost regular occurrence of diarrhœa after the application of radiation to the abdomen, and is obviously a factor imposing a severe limitation upon the application of massive doses of radiation to the abdomen.

General Effects Observed in Vitamin-A Deficiency.

This lesion of the intestinal mucous membrane is an adequate explanation of the different general effects observed in vitamin-A deficiency: cessation of growth and occurrence of bacterial infections. Cessation of growth in a young animal must naturally result from an atrophic condition of the intestinal mucous membrane which interferes with the absorption of food. It is equally obvious that such a condition affords the intestinal bacteria a ready access to the tissues and the blood-stream. It is known that one of the mechanisms by which the body defends itself against the invasion of the blood by bacteria—especially avirulent bacteria—is the agglutination of the bacteria by the blood platelets, and that an intravenous injection of such bacteria is followed by a temporary diminution in the number of platelets. In vitamin-A deficiency the progressive atrophy of the intestinal mucous membrane leads to a continued and increasing invasion of the blood-stream by intestinal bacteria which are being agglutinated by the platelets. This continued and progressive drain on the platelets may in itself be the explanation of the thrombopenia which sets in sooner or later in vitamin-A deficiency; or there may be a direct atrophic change in the tissue or cells which form platelets. Observations on the effect of light indicate that the latter alternative is probably correct. Eventually the number of platelets is diminished to such a low level that the defence against the bacteria becomes ineffective.

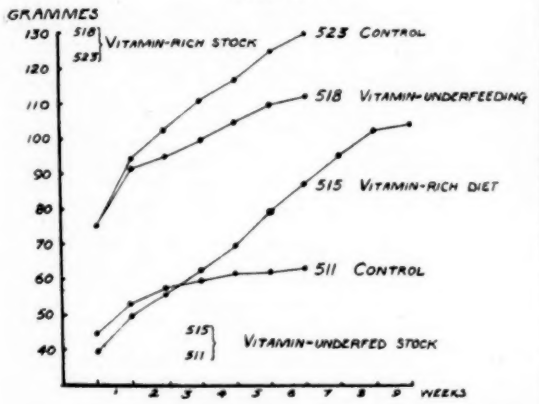
When vitamin A is supplied again in abundance by giving cod-liver oil the intestinal lesion heals over rapidly; the invasion of the blood-stream by bacteria is arrested, the platelets rapidly increase in number, and the normal defences of the organism are enabled to deal with the avirulent bacteria. We have here again two possible alternatives: cod-liver oil may have a direct stimulating effect on the platelet formation or the increase in number may be due merely to removing the drain on the platelets by arresting the bacterial invasion from the intestine. This will be referred to again in discussing the effect of light on the organism. It is interesting to note that in the healing over of the intestinal mucous membrane, the epithelial cells in the crypts of Lieberkühn are mainly, if not entirely, concerned, since only there can active cell division be seen. I have never seen any mitoses in the villi themselves. It would appear, therefore, that normally the intestinal epithelium regenerates itself from the cells most deeply situated, very much in the same way as the skin epithelium is regenerated.

Another observation of general importance is that the condition of the intestinal mucous membrane varies, even on natural diets, with the richness of the diet in vitamins. In a stock kept on a vitamin-rich diet the villi of the intestinal mucous membrane are larger and more massive than in a stock kept on our ordinary laboratory diet, which contains just enough vitamins to enable the animals to grow and to breed and to prevent the onset of obvious disease, but has a very restricted content of vitamins. A comparison of Fig. 2 from an animal on such a vitamin-restricted diet with Fig. 1 from an animal on a vitamin-rich diet shows this difference clearly. I have given intentionally in Fig. 2 the optimum condition of the intestine of rats fed on our ordinary laboratory diet. Occasionally one finds in rats kept on this diet a much more atrophic condition, sometimes with extensive necrosis of the villi resembling the condition illustrated in Fig. 3. In a previous paper[6] I have shown that animals from stocks kept on such a diet restricted in vitamin content, or "underfed with vitamins" as it was called, react much more rapidly to a vitamin-A deficiency: they will stop growing at once when vitamin A is withheld, and develop the typical eye lesion within eight to nine weeks, while animals from a vitamin-rich stock, kept in the same cage on the same diet, may continue to grow actively for several weeks, may not develop the eye lesion within six months, and at the end of that time have quite a normal appearance, although eventually they decline in health. The difference in the condition of the intestine in the two stocks explains this apparently paradoxical phenomenon; atrophy of the intestinal mucous membrane will, of course, proceed much more rapidly in an animal in which the full development of the intestinal mucous membrane has never been attained, and may even be definitely atrophic owing to having been kept since birth on a vitamin-restricted diet. The fact that rats apparently normal, in the sense that they do not show any macroscopic obvious sign of disease, may have definite pathological lesions in the intestine introduces a fallacy into vitamin experiments which has not received consideration. This fallacy can be guarded against, although not entirely eliminated, by using for such experiments only animals bred in the laboratory and kept on a diet of a known and constant vitamin content. In order to illustrate graphically the extent to which the general condition of an apparently normal rat as expressed in its weight curve is dependent, not merely on the presence of vitamins, but on the presence of *abundant* vitamins, I give curves (Fig. 6) showing the typical behaviour of four normal rats belonging to two litters of practically the same age. Rats No. 511 and 515 belong to litter A, which had been kept since birth on our ordinary laboratory diet (bread, water, maize, and rice); rats 523 and 518 belonged to another litter of the same age and kept on the same diet supplemented by marmite and cod-liver oil. When three months' old, one rat of the vitamin-underfed litter A was placed on the vitamin-rich diet (No. 515), and one rat of the vitamin-rich litter B was placed on the ordinary laboratory diet and thus subjected to vitamin-underfeeding (No. 518). The curves readily explain themselves in the light of our observation that vitamins have a stimulating action on intestinal functions.

It should be noted that the rats from the "vitamin-underfed" litter are in appearance perfectly healthy-looking normal animals; they are, in fact, our usual laboratory stock. They only differ in appearance from rats of the same age, kept on a vitamin-rich diet, by being smaller. If in the present experiment the exact age of rats Nos. 511 and 515 had not been known, they might have been taken for younger animals which had been kept on a vitamin-rich diet. The experiment shows how even such healthy animals may benefit by increasing the supply of vitamins. The great susceptibility of the intestinal mucosa to

the supply of vitamins, especially the fat-soluble vitamin A, and the occasional occurrence of atrophic and sometimes of definite pathological changes on a natural diet which enables the animal to lead an otherwise normal vegetative and reproductive life has an important bearing on problems of general importance. For since this diet, so far as its restricted vitamin content is concerned, is not unlike that on

FIG. 6.



Weight curves of four rats of the same age belonging to two litters. Rats Nos. 511 and 515 had been kept on the laboratory diet since birth; rats Nos. 518 and 523 had been kept on the laboratory diet supplemented with cod-liver oil and marmite. The curves illustrate the stunted growth of healthy rats produced by vitamin underfeeding, and the beneficial effect of the addition of vitamins even on such healthy rats. The condition of the intestine of two of the rats (Nos. 511 and 523) is represented in Figs. 1 and 2.

which large classes of civilised mankind live, this factor may account for numerous conditions of vague ill-health, stunted growth, and intestinal derangements and toxæmias for which there is at present no adequate explanation.

Vitamins as "Food Hormones."

If we review the foregoing statements concerning the mode of action of the two vitamins A and B which are essential for the normal life of the rat, we find that the absence of these vitamins interferes with the usual functions of the digestive tract. In the absence of vitamin B the normal assimilation of food is impaired owing to the atrophy of the lymphoid tissue. In the absence of vitamin A there is the obvious impediment due to the atrophic intestinal mucosa. This relationship is analogous to the relationship which exists between certain endocrine organs and specific tissues. Thus we get atrophy of the uterus when the ovary is removed, and atrophy of the testes when the pituitary is damaged or partially removed. From such facts the existence of a hormone with a specific stimulating action is postulated. The stimulation is in many cases only inferred from the occurrence of atrophic changes in the absence of these hormones. The observations with vitamins provide more conclusive evidence of the existence of a direct specific stimulating action. There is the rapidity with which the lymphoid tissue or the intestinal mucosa, as the case may be, recovers, when the appropriate vitamins are administered after a previous deficiency. Further, there is evidence that the organism recovers more rapidly from a lymphopenia induced by radiation when an abundant supply of vitamin B is administered. The most conclusive proof of the existence of a direct stimulating effect of vitamins on the intestinal activity of perfectly normal animals was given by us in a previous paper in which fat absorption was taken as a microchemically demonstrable criterion.

These observations, then, lead to the conception that these food-accessory substances, called vitamins, are "food-hormones"—that is to say, the different articles of food contain, in varying but always small amounts, substances having a drug-like stimulating action on the digestive tract. And, further, the full functional activity of the digestive tract is dependent on an abundant and continued supply of these substances in the food, in the same way as the full functional activity of the uterus is dependent on a continued supply of the ovarian hormones. We can recognise in these food hormones from their specific mode of action two groups of substances—that group which stimulates the lymphoid tissues and is essential for its functional integrity, now known as the water-soluble vitamin B, and that which stimulates the intestinal mucous membrane and is necessary for its integrity, now known as the fat-soluble vitamin A. The latter has also directly or indirectly a stimulating effect on the formation of the blood platelets. We may notice, in passing, that this conception brings out a relationship between an organism and its environment which is interesting from an evolutionary point of view: the apparatus which is responsible for the absorption of food in a highly differentiated animal is itself dependent for its functional integrity upon the presence in the food itself of these hormone-like substances.

Therapeutic Applications.

In a previous paper the necessity of ensuring an abundant supply of vitamins in the food, especially of the young, was pointed out. It was shown that there is such a condition as "underfeeding with vitamins" which does not manifest itself by any obvious signs of disease, but which prevents the organism from attaining its full development and makes it more susceptible to dietetic disorders. The fact that the intestinal mucous membrane is less fully developed in such vitamin-underfed animals lends further support to this view.

But our observations suggest further that preparations such as cod-liver oil or yeast preparations, which are especially rich in these food hormones, represent drugs with definite actions which may be of considerable therapeutic value in conditions not necessarily due to vitamin deficiency or vitamin underfeeding. Certain forms of marasmus in infants, not due to deficiency of vitamins, are stated to yield rapidly to the administration of preparations rich in vitamins. Probably the primary lesion in these conditions is an imperfect development of the digestive tract.

Dr. William Hunter[7] attributes great importance to lesions in the digestive tract in the ætiology of pernicious anæmia, and it is suggestive that we have repeatedly observed an anæmia to set in both in vitamin-A deficiency and after exposure to radium, where intestinal lesions occur. It is well known that the anæmia produced by exposure to radium is of a pernicious type. Dr. J. A. Murray has informed me that, in his experience as a pathologist to a lunatic asylum, he has frequently observed atrophic lesions in the intestine of patients suffering from melancholia. It seems possible that the administration of vitamin-rich preparations may be of use in such conditions.

Vitamins and Light.

Observations on the effect of light on the organism which we have carried out in collaboration with Dr. A. H. Drew have shown that light acts as a stimulus to the production of blood platelets. We intend to publish the results in detail elsewhere. Here I shall deal only with that aspect of the subject which has a bearing on the action of the fat-soluble vitamin A. Rats kept in the dark since birth show a considerable reduction in the number of platelets. They exhibit no gross intestinal lesions, their growth and appearance is normal when compared with rats kept in daylight on the same diet, and they do not show the characteristic infections (xerophthalmia, septic lymph glands) appearing in fat-soluble vitamin deficiency. But when exposed to such a deficiency they develop these lesions sooner than rats kept in daylight. Conversely, when rats are kept on a diet free from vitamin A the application of light delays the fall in

the number of platelets. It also delays the general decline of the animal and the onset of xerophthalmia, although it cannot altogether prevent them. The apparently paradoxical fact that light can to a certain extent counteract a dietetic deficiency can thus be readily explained on morphological grounds; vitamin-A deficiency produces a twofold lesion—a lesion in the intestinal mucosa and a diminution in the number of platelets. Light acts as a stimulus to the formation of platelets, and thus strengthens one of the defensive mechanisms against bacterial invasion from the intestine.

Summary.

From observations on the pathological lesions induced by vitamin deficiencies a mass of evidence has gradually accumulated which points to the digestive tract as the key to the problem of the mode of action of these food accessory substances. The functional integrity of the digestive tract is dependent on the presence in the food of certain substances with specific drug-like actions, very much in the same way as the functional integrity of the uterus is dependent on a hormone produced by the ovary. These accessory food substances may therefore be looked upon as "food hormones." Two groups with different specific actions can at present be distinguished—one group (now called the water-soluble vitamin B) has a specific stimulating effect on lymphoid tissue. The other group (now called the fat-soluble vitamin A) has a specific stimulating effect on the intestinal mucous membrane, and also directly or indirectly on the formation of blood platelets. These specific effects afford an adequate explanation of the general changes produced in an animal by restricting or completely withholding vitamins from the food.

An interesting relationship is thus brought out between an animal and its environment; the food itself contains specific substances on which the integrity of the apparatus responsible for the digestion and absorption of food depends. The therapeutic applications following from this conception are briefly discussed.

Addendum.—The view that vitamins have a drug-like action on the digestive tract which may be used for therapeutic purposes has received confirmation from some recent observations of Murlin and Mattill "on the laxative action of yeast,"[8] which have appeared since our paper was sent in for publication. Murlin and Mattill have tested some old clinical observations of a number of French clinicians,[9] who found brewer's yeast to be a valuable remedy in intestinal disorders. Some recommend it as a laxative, others find it an important remedial agent in enteritis, typhoid, and various types of diarrhœa, including diarrhœa in infants. The carefully controlled investigations of Murlin and Mattill show that fresh yeast has a distinct laxative effect in normal men. They also find a prolonged increased excretion of uric acid in the urine, and evidence of diminished intestinal putrefaction. Murlin and Mattill do not refer these effects to the presence in the yeast of water-soluble vitamin B, but are inclined to attribute the effect to the nucleins of yeast. These effects on man are in complete agreement with our observations in rats of the effect of vitamin B, given in the form of a commercial preparation of autolysed yeast. The fact that yeast has a laxative effect in normal people does not exclude, as Murlin thinks, the possibility that yeast in virtue of its vitamin-B content might have a remedial effect in certain types of enteritis. His results read in the light of our conclusions make further clinical observations desirable, preferably where autolysed yeast is used.

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THE TREATMENT OF AURICULAR FIBRILLATION BY QUINIDINE SULPHATE.

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AURICULAR fibrillation is a functional disorder of rhythm arising in a heart that was previously contracting with an orderly regular rhythm known as sinus rhythm. Normally the healthy adult heart contracts some 70 to 80 times per minute, in response to impulses generated and discharged at a regular rate. These impulses arise in the pace-maker of the heart—the sino-auricular node, a small collection of fibrous tissue in which are numerous specialised muscle fibres, some nerve cells, and some nerve fibres; it is situated in the right auricle, near the opening of the superior vena cava, and the vagal and sympathetic nerve-trunks are connected with it. When auricular fibrillation occurs, the function of the pace-maker remains in abeyance, and its rôle is taken up by the muscle fibres of the auricular walls. These fibres have hitherto only been accustomed to *conduct* impulses from the pace-maker to the ventricles. With the onset of auricular fibrillation they assume a new function, and *generate* some 400, 500, or 600 impulses per minute.

In auricular fibrillation, then, these impulses replace the 70 to 80 impulses formerly generated by the specialised fibres of the pace-maker; they are conveyed by the auriculo-ventricular bundle to the ventricles, which cannot respond to so large a number of impulses, but do respond to many of them, albeit in a disorderly fashion; thus the ventricular contractions follow one another at irregular periods and are of varying force. Consequently when auricular fibrillation occurs, a pulse previously regular in force and rhythm becomes totally irregular in both respects—becomes, in fact, the characteristic and generally rapid pulse of auricular fibrillation. This change of pulse coincides with virtual paralysis of the auricle. Sir James Mackenzie predicted this paralysis in 1902, although in 1907–08 he changed his view, arguing that when this "pulsus irregularis perpetuus" occurred auricles and ventricles contracted synchronously, and he called the irregular rhythm nodal rhythm. During the years 1909–11 Sir Thomas Lewis proved that when this type of pulse occurred, the auricles were in a state of passive distension and their walls exhibited the fine movements known as fibrillation, a condition readily produced experimentally in animals by faradisation of the auricles.

Auricular fibrillation does not arise unless there is some pathological condition of the myocardium; it may accompany valvular disease of the heart, or myocardial degeneration without disease of the valves. It occurs in rheumatic and non-rheumatic hearts, in both sexes and at all ages, though it is extremely rare in childhood. Its presence can generally be inferred by the stethoscope alone, but more reliable information can be obtained from a sphygmographic tracing of the radial artery, while a simultaneous record of the radial artery and jugular vein by means of the polygraph will yield a still more certain diagnosis. The electro-cardiograph alone furnishes absolute proof of the new rhythm.

(*Continued from preceding column.*)

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Why Does Auricular Fibrillation Call for Treatment?

Sooner or later, and generally sooner, auricular fibrillation leads to cardiac failure, and for this reason calls for treatment. Little more than 20 years ago the view held was that when cardiac failure set in the pulse frequently became irregular. To-day we realise that the irregular rhythm of the pulse, or rather the irregular action of the heart, of which the pulse is the indicator, causes the heart to fail. Sir Thomas Lewis points out that in 60 to 70 per cent. of the cases of cardiac failure in the wards of general hospitals auricular fibrillation is present; and I would add that the vast majority of these cases would not be in-patients had not auricular fibrillation occurred. Out of 30 heart cases with auricular fibrillation under my care at the Queen's Hospital, Birmingham, during the past 18 months, more than half had no symptom of any cardiac disease whatever until the onset of auricular fibrillation. In the remaining cases shortness of breath on exertion or palpitation preceded the onset of auricular fibrillation, but as a rule were not sufficient to interfere with an active life. With the onset of auricular fibrillation more or less chronic invalidism followed. The following cases are typical.

CASE 1.—A motor engineer, aged 29, was admitted into hospital on Nov. 7th, 1922, with a hypertrophied heart (the apex beat was in the fifth space, 4 inches from the mid-sternal line, the cardiac impulse was strongly heaving), and the physical signs of mitral stenosis with auricular fibrillation. He had an attack of rheumatic fever at 9 years of age, and was in bed for two months. Had lived a normal life since that time, and had carried on his occupation uninterruptedly until five weeks before admission, although there was evidence of some restriction in the response of his heart to effort, in consequence of which he had given up cycling. Presumably auricular fibrillation occurred five weeks before admission, when, on his way to work, going uphill at his ordinary pace, he was suddenly seized with violent palpitations and a sense of suffocation. He rested for some minutes, and then managed to reach the factory in a state of great distress. Immediately after his arrival he was taken home in an ambulance, and remained in bed for four weeks. A week later he was admitted into hospital, and 20 days after admission sinus rhythm was restored by five doses of 6 gr. quinidine sulphate.

CASE 2.—A blacksmith, aged 62, was admitted into hospital on Nov. 3rd, 1922, with a large heart (the cardiac impulse was in the fifth space, 5½ inches from the mid-sternal line), and auricular fibrillation. There was no evidence of valvular disease; the myocardial change was probably of rheumatic origin, for about 12 years ago he had been laid up in bed for two or three weeks with what was probably an attack of rheumatic fever. He had, however, never known breathlessness until one day in July, 1922, when walking uphill, he suddenly became breathless, and realised some change in the heart's action. His doctor sent him to bed the same day, and he remained there for two months. With this rest breathlessness improved up to a point, but on getting up œdema of the legs and scrotum appeared, and he was only able to walk a very short distance on the level. In this state he was admitted to hospital, and three weeks later sinus rhythm was restored, after two doses of 6 gr. quinidine sulphate.

Here there were no symptoms of any cardiac inefficiency until auricular fibrillation occurred; in the first case there was some evidence of cardiac inadequacy over a period of years, but no serious cardiac failure until auricular fibrillation set in.

The Two Forms of Auricular Fibrillation.

Auricular fibrillation is met with in two forms: (1) A temporary affection, occurring in paroxysms lasting a number of hours, days, or weeks, and forming one of the varieties of paroxysmal tachycardia. (2) A chronic affection which is generally permanent—I say generally permanent, because even where fibrillation has persisted for some months it may cease spontaneously, and the cardiac contractions may again come under the control of the pace-maker. Auricular fibrillation is only a functional disorder; there is no a priori reason why sinus rhythm should not be re-established however long the auricles have been fibrillating. Nevertheless the rule is, that once established, the new rhythm is permanent and exceptions are rare.

Attacks of paroxysmal tachycardia due to paroxysms of auricular fibrillation either terminate spontaneously, or can be terminated by digitalis, and with the cessation of the paroxysm the normal sinus rhythm is re-established, for this is the meaning of the term "paroxysmal tachycardia." The administration of quinidine sulphate in these cases, for the purpose of restoring sinus rhythm, need not therefore be discussed. It is reported, however, that the drug has been used with advantage for controlling the frequency of the attacks in paroxysmal auricular fibrillation.[1]

Chronic or permanent auricular fibrillation is met with in three classes of cases, which may be described as (1) temporarily disabled; (2) walking cases; (3) permanently disabled.

(1) *Temporarily Disabled.*—Under this heading I group the majority of cases of auricular fibrillation as seen in practice. The patient is compelled to be in bed; dyspnœa is severe, and generally amounts to orthopnœa; there is œdema, cyanosis, fullness of the jugular veins, albuminuria, enlarged and congested liver, and possibly evidence of congestion and œdema of the lung bases. The pulse is rapid, 120–150 per minute, and irregular in force and rhythm; a false impression of the cardiac contractions is frequently given, as many of the beats fail to affect the radial artery at the wrist. Under treatment, rest in bed and digitalis, these cases do well and pass into Class 2.

(2) *Walking Cases.*—These patients, in spite of auricular fibrillation, can lead active and often strenuous lives, either without digitalis, or with the help of an occasional course of digitalis, or by taking small doses of the drug regularly. They may live in comfort for years, but from time to time are liable to lapse into Class 1, from which rest in bed and a course of digitalis will restore them to Class 2. For the most part Class 2 are the convalescents of Class 1, although occasionally patients are found belonging to this class who have never suffered from a severe attack of cardiac failure.

(3) *Permanently Disabled.*—These are cases of auricular fibrillation with symptoms similar in every way to those of Class 1, but in whom, though the pulse is slow in rate (a bradycardia of 30 to 40 per minute, or a normal rate of 60–70 or 80 per minute), no improvement follows any form of treatment; their course is progressively downwards. The slow rate may be the result of digitalis therapy, or it may occur independently of drugs—i.e., the nodal bradycardia of Sir James Mackenzie. The characteristic feature of these cases is that although the pulse-rate is within normal limits or abnormally slow (bradycardia), the dyspnœa, dropsy, and cyanosis persist and gradually increase, in spite of all treatment. The prognosis is hopeless. The myocardium is worn out. Here auricular fibrillation is not the cause of cardiac failure, but an accidental concomitant, or possibly a result of that failure, a means of setting free the worn-out ventricle from the control of the pace-maker. There is no question of restoring sinus rhythm by means of quinidine; even if the rhythm were restored, the patient would be no better off. The rule is for auricular fibrillation to be accompanied by a rapid pulse-rate of 140–150 per minute; as Sir Thomas Lewis has pointed out, the pulse tends to double its rate. Where auricular fibrillation coexists with a pulse of normal or subnormal rate (bradycardia) the explanation is probably that the myocardial degeneration responsible for the altered rhythm is also responsible for affecting some of the junctional fibres between auricle and ventricle; in other words, degeneration of the myocardium has caused a certain degree of auriculo-ventricular heart-block. What degenerative changes have effected in the course of months or years in Class 3, digitalis can effect in the course of hours or days in Class 1.

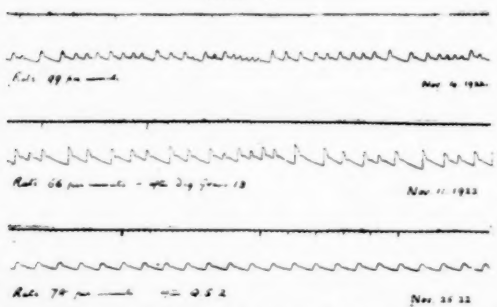
[1] Parkinson and Nicholl: THE LANCET, 1922, ii., 1267.

Treatment of Auricular Fibrillation.

A great deal of harm will accrue to sufferers from auricular fibrillation if the value of digitalis is lost sight of in the quest of new drugs like quinidine. Digitalis has a specific action on auricular fibrillation and cannot be replaced. It is difficult to say whether in the order of nature digitalis or auricular fibrillation was first evolved, but it is highly probable that digitalis would never have been recognised as a potent drug for the removal of dropsy had not auricular fibrillation been the cause of the dropsy. Quinidine may supplement digitalis, but will never supplant it. The two drugs have different functions and must be used accordingly. The indication for digitalis in cases of cardiac failure is auricular fibrillation with a ventricular rate above normal. If given in sufficient amount, digitalis will not fail to lower the rate from 150–160 per minute to a rate of 60–70–80 per minute, and with this drop in the pulse-rate, in practically all cases, the dyspnœa, dropsy, and cyanosis, &c., will gradually improve. In a very small percentage of cases (Class 3) no improvement follows.

Digitalis appears to act on the junctional fibres between auricle and ventricle, for the electro-cardiograph shows that the fibrillations of the auricle are undisturbed though the ventricular rate is lowered. The Class 1 patient having been brought into Class 2—i.e., so far restored as to be able to walk a short distance on the level—is now, and not till now, ready for quinidine administration; the latter can convert the abnormal rhythm to the normal sinus rhythm. Digitalis, however much it may improve the patient's condition, will not produce this result (Figs. 1 and 2).

FIG. 1.



Sphygmograph of a male aged 62. Myocardial degeneration with auricular fibrillation. 1. Before treatment: rate 99, rhythm irregular. 2. After digitalis: rate 66, rhythm irregular. 3. After quinidine: rate 78, rhythm regular.

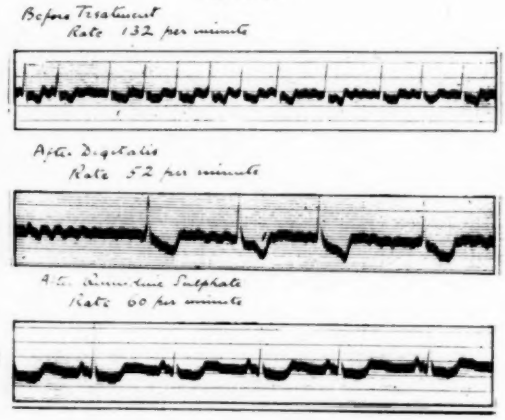
On the other hand, quinidine sulphate must not be used to restore cases with cardiac failure, this is the rôle of digitalis; quinidine will only restore rhythm. But if there are no symptoms of cardiac failure, why give quinidine or any other drug? Because the patient is better with a normal rhythm than with auricular fibrillation, for the cardiac efficiency is greater. It is not easy to give scientific proof of such a statement, but there are cogent reasons for believing it to be true, and personally I have no doubt about it.

Statements of Patients.

(1) Patients state that they are more comfortable, feel better, and can do more after restoration of the sinus rhythm.

CASE 3.—A married woman, aged 46, had symptoms of breathlessness on exertion and a winter cough since childhood. She had a large heart, obscured by an emphysematous lung. Transverse diameter 7 inches. No evidence of valvular disease. She had had three attacks of rheumatic fever, at 12, 25, and 33 years of age. Her cardiac inefficiency was not great, for, in addition to her housework, she was able to work regularly during the war "on shells." In September, 1920, she caught cold and had "a dry cough which pulled her to pieces," and probably at this time auricular fibrillation occurred, for she then became invalided. She was admitted to Queen's Hospital three times between December, 1920, and December, 1921, with marked cyanosis, dropsy, and auricular fibrillation with rapid pulse. Each time she left hospital freed from all distressing symptoms after a course of digitalis, but on each occasion the improvement was temporary. On Jan. 6th, 1922, she was admitted for a fourth time, again cyanosed and œdematous, and with the irregular pulse of auricular fibrillation, which varied in rate from 120 to 170 per minute.

FIG. 2.



Electro-cardiograms of female, aged 28, with mitral stenosis of rheumatic origin, and auricular fibrillation. 1. Before treatment. 2. After digitalis. 3. After quinidine.
Note.—Although digitalis has slowed the ventricle from 132 to 52 beats per minute, fibrillation of the auricle is still present. After quinidine, sinus rhythm is restored.

The pulse was brought down to 70–80 per minute by digitalis, and on the 10th, after 54 gr. of quinidine administered in nine doses in 16 hours, sinus rhythm was restored. Three weeks later she left hospital, and remained well and in active work until Jan. 31st, 1923, when auricular fibrillation recurred, but only after an interval of 12 months. This time sinus rhythm was re-established after five doses of quinidine taken in two days.

In this case the value of quinidine is evident, for during the year 1921 the patient was in and out of hospital three times and more or less of an invalid when at home. During the year 1922, after restoration of the sinus rhythm, she led the active life of a housewife, and was not taking any drugs.

(2) Patients successfully treated with quinidine, in whom auricular fibrillation has recurred, return to hospital for a further course of quinidine. In some cases patients themselves treat recurrent attacks successfully at home, having learnt the details of treatment in hospital.

(3) The volume of the pulse is greater with a sinus rhythm than when auricular fibrillation is present. Sphygmographic tracings show a conspicuous difference between the small volume of the pulse tracings of auricular fibrillation and that of sinus rhythm. In taking pulse tracings before and after quinidine administration it is often difficult to obtain a satisfactory tracing during the stage of auricular fibrillation, but this becomes quite easy when sinus rhythm is established; this change in volume of the pulse is well appreciated by the nursing staff in charge of my cases at Queen's Hospital. They know when the pulse becomes regular in a doubtful case, rather by the increased volume than by actual regularity of rhythm, for when sinus rhythm has been restored its regularity is not uncommonly obscured by occasional extrasystoles. This increase in volume has a practical bearing on the watching of cases under quinidine treatment; in many cases during the passage from auricular fibrillation to sinus rhythm there is a period in which auricular flutter replaces auricular fibrillation, and when this occurs the pulse is generally regular, albeit often rapid.

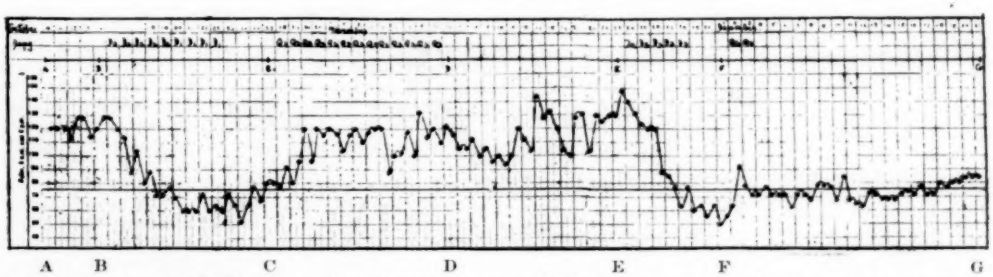
This increase in the volume of the pulse is due to restoration of function of the auricle. During

fibrillation the auricle is virtually paralysed, during sinus rhythm its coördinate contraction helps in the final stage of the filling of the ventricle. Hence in sinus rhythm the ventricle is better filled with blood than in auricular fibrillation. Possibly another factor in this increase of volume is that in auricular fibrillation all the ventricular fibres do not participate in every ventricular contraction, while in sinus rhythm they do. As Sir James Mackenzie has pointed out, when the stimulus arises in the muscle fibres of the auricle instead of in the sino-auricular node, the ventricular systole is often partial and ineffective, and so the volume of the pulse is small.

(4) The greatest gain to the patient when auricular fibrillation is restored to sinus rhythm is stability of the pulse. In auricular fibrillation a walk of 50 yards on the level may increase the pulse-rate by 20 to 50 beats per minute, whereas with sinus rhythm the same amount of exercise will not increase the same patient's pulse-rate at all.

The accompanying chart (Fig. 3) shows the pulse of a female, aged 20, suffering from mitral stenosis of rheumatic origin, and illustrates the instability of the pulse when auricular fibrillation is present, A—F, compared with the stability of the pulse when sinus rhythm is present, F—G. The chart covers a period of 10½ weeks.

FIG. 3.



A—B = Pulse-rate on admission. B—C = Fall of pulse-rate under digitalis. C—D = Rise of pulse-rate under unsuccessful course of quinidine. D—E = Rapid and variable pulse, all drugs omitted. E—F = Fall of pulse-rate under digitalis. F—G = Sinus rhythm restored by a two days' course of quinidine and immediately followed by a steady pulse-rate, although patient was taking no drugs and was walking about. A—F = Auricular fibrillation present, and patient was confined to bed. At B and again at E administration commenced of tabloids of digitalin (cryst.) 1/250 gr.; at C and again at F, doses of quinidine sulphate, 6 gr.

In September, 1921, I began treating cases of auricular fibrillation with quinidine sulphate. Since this date I have treated 30 cases, and have failed to restore sinus rhythm in two; if only suitable cases be selected, I believe that quinidine will *always* restore the sinus rhythm. I account for the two failures by having included what I now consider to be two cases unsuitable for treatment.

Selection of Cases.

In selecting cases for quinidine therapy, I have based my selection entirely on the response of the patient to digitalis. Given a case suffering from cardiac failure with auricular fibrillation, the patient is treated in the routine manner by rest and digitalis, with purgatives and blood-letting if necessary. If —as in the vast majority of cases—the patient responds well to treatment, we may deduce that auricular fibrillation is the cause of the cardiac failure; in these cases quinidine should be used, for if we can change the rhythm we cure the heart failure. If, however, there is no satisfactory improvement in the patient's state, in spite of the lowering of the ventricular rate to within normal limits, then cardiac failure is due not to auricular fibrillation, but to a worn-out heart muscle. This only occurs in a small number of cases, and in these quinidine should not be used. The restoration of sinus rhythm is not called for—it may even be prejudicial. Before assuming, however, that a case of auricular fibrillation will not respond to digitalis, the drug must be given in full doses, much greater than those frequently adopted.

The Limitations of Quinidine.

(1) Quinidine must be regarded as a drug merely for altering an abnormal rhythm, and not for treating symptoms of cardiac failure.

(2) While quinidine is capable of restoring sinus rhythm in a case of auricular fibrillation, it will not prevent its recurrence. Its utility in a given case, therefore, entirely depends upon the liability for auricular fibrillation to recur; this liability cannot at present be estimated, for the exciting cause of auricular fibrillation is unknown, as is that of the occasional extrasystole giving rise to the so-called intermittent pulse.

The predisposing cause of fibrillation is well recognised as some degenerative change in the muscular fibres of the auricle; but there must be some immediate excitant which conceivably reaches the auricle through the nervous system, for its action is instantaneous. This indeterminate excitant factor constitutes one of the limitations of quinidine, for while this drug can restore sinus rhythm, it cannot prevent the recurrence of fibrillation.

Cases vary greatly in the length of time that sinus rhythm is maintained after quinidine therapy. In some of my cases rhythm has remained regular, and cardiac efficiency at a relatively high level, for 12 months and over; but other cases have relapsed while still in hospital, in the course of a few days. I now make a practice of restoring such cases three or four times; if a further relapse occurs I recommend the patient to make himself familiar with the use of digitalis, on which he may have to depend for the rest of his life, taking the drug as occasion demands.

Dangers of the Drug.

I have had no fatalities. Minor symptoms, such as headache, nausea, vomiting, giddiness, are not infrequently complained of. Serious symptoms appeared in three cases: in one a temporary hemiplegia, possibly the result of embolism; in another epileptiform attacks at noon, 5.30 P.M., and 7 P.M. on the same day; in a third an epileptiform seizure occurred with cessation of respiration and failure of the pulse. The patient was restored by artificial respiration. A second less severe seizure occurred three hours later on the same day. All three patients completely recovered and were none the worse 24 hours afterwards. In the first two cases these alarming symptoms occurred whilst the auricle was fibrillating, but in the third case sinus rhythm had already been established for 22 hours.

All had been treated with small doses of the drug; in no cases where large doses (48 or even 60 gr. per day) had been given were there any serious symptoms.

Dosage.

I have found no reason for departing from the original dose recommended by Frey—viz., 0·4 g. (approximately 6 gr.). It is given in capsules by the mouth. With regard to frequency of dosage, after trying many variations, I have been led to regard the following as the safest and most successful. One dose is given the first day, two the second, three the third, and so on till a maximum of ten doses may be reached. This large number, however, is rarely necessary, the majority of the cases being restored on the second, third, or fourth day. The dose is repeated every two hours, and I find it convenient at hospital to give the initial dose at 5 A.M., so that on the fourth day of administration, for example, the patient has a capsule at 5, 7, 9, and 11 A.M.

The pulse is recorded hourly, and if necessary the nurse is instructed to estimate the ventricular rate from the apex beat. She records not only the rate, but also the rhythm, adding the word "regular" or "irregular" to the pulse chart. The quinidine is discontinued as soon as a regular rhythm is noted, and the patient, who has been kept in bed during the administration of the drug, is allowed up on the following day. Electro-cardiograms are taken as controls as often as may be found necessary. No rhythm is accepted as sinus rhythm without confirmation by the electro-cardiograph. I have found no advantage in persevering with small doses of quinidine after sinus rhythm has once been established.

A point of importance is that the intervals between successive doses of quinidine should be short, for quinidine seems to be rapidly eliminated. I have succeeded with small quantities of the drug given at two-hourly intervals in cases unaffected by much larger quantities given at six or even four-hourly intervals. I have found it undesirable to give digitalis and quinidine at the same time. The secret of success depends, in my opinion, on not being in a hurry to give quinidine. Rest in bed and digitalis must first bring about such improvement in the degree of heart failure that no further benefit can be obtained from digitalis. As a rule, the patient will be able to walk for half an hour on the level without discomfort. When this stage has been reached, two or three days should be allowed to elapse without digitalis, and then a course of quinidine may be commenced.

In conclusion, I may state that for the treatment of cardiac failure with auricular fibrillation, digitalis is a specific remedy and quinidine an invaluable coadjutor.

BOGNOR WAR MEMORIAL HOSPITAL.—The premises in Chichester-road, Bognor, which thanks to the generosity of Mr. James Fleming, of Aldwick Grange, were opened for patients in July, 1919, and were adopted by the town as the war memorial, have already outgrown the demands made upon them. At the annual meeting on May 14th an extension fund was opened with the object of making provision for the erection of new buildings which would be more suitable for the purposes of a hospital and which would contain accommodation for paying patients. In-patients during the year ended March 31st numbered 148, and out-patients 1819. The income was £1750 8*s.* 10*d.*, and the expenditure £1444 16*s.* 6½*d.*, showing an excess of income over expenditure of £305 12*s.* 3½*d.*

CONTROL OF VENEREAL DISEASES: RESOLUTIONS OF THE SCOTTISH COMMITTEE.—The May issue of *Health and Empire* has printed an account of the conference held at Glasgow on March 8th, when representatives of local authorities met members of the Scottish Committee of the National Council for Combating Venereal Diseases. Three important resolutions were passed at this meeting:—

That in the opinion of this conference the present law and machinery are inadequate to secure the proper control and treatment of venereal diseases.

That in order to secure adequate control of venereal diseases (both acquired and congenital) it is essential that a system of notification should be introduced.

That it is essential every person suffering from V.D. should be required by law to place himself or herself under treatment by a qualified medical practitioner and to continue under such treatment until pronounced free of infection.

Of these resolutions the first and second were carried unanimously and the third with two dissentients.

NOTES ON
ONE HUNDRED HUMAN FŒTUSES.

BY M. F. LUCAS KEENE, M.B., B.S. LOND.,
UNIVERSITY READER IN ANATOMY, LONDON (ROYAL FREE HOSPITAL) SCHOOL OF MEDICINE FOR WOMEN;

AND

EVELYN E. HEWER, D.Sc. LOND.,
LECTURER IN HISTOLOGY AT THE ABOVE SCHOOL.

FOR the past four years we have been engaged in an investigation of the stillborn human fœtus, one of us (M. F. L. K.) concentrating upon the relations between certain fœtal abnormalities and the ductless glands, and the other (E. E. H.) upon the possible part played by the ductless glands in stillbirth. Full analyses of our cases (already about 250 in number) are not yet available, but we were much interested to note that Eardley Holland [1] has found that in 167 fresh (non-macerated) fœtuses of viable age, 81—i.e., 48 per cent.—had sustained tears of the tentorium cerebelli. This observation differs so widely from our own findings that the latter seem definitely worth recording.

1. *Tentorial Tears and Subdural Hæmorrhage.*

For the purpose of this report we have taken, without any selection, the last 100 fresh fœtuses of viable age received, and divided them into full-time (67) and premature (33) births. With regard to tears of the falx cerebri, it is not uncommon to find fenestrations of this fold of dura mater in dissecting-room subjects; possibly these were actually produced at birth. We found that the dural folds varied very much with regard to fragility in different fœtuses, the greatest care being necessary in some cases in examination of this region; but in one case (not included in the 100 under discussion) there had been considerable subdural hæmorrhage, probably from the vein of Galen, yet the dura mater was intact, and, further, it was found that the fœtus, weighing 6½ lb., could be suspended for a short time by its falx cerebri without any tears appearing. We ourselves have carried out almost every post-mortem examination, and tedious as this method may be, and cramping as regards the amount of material that can be dealt with, we feel that it has its merits in that the personal factor in observation is eliminated.

(*a*) *Full-time Fœtuses.*—Of these 67 fœtuses, only five—i.e., 7·5 per cent.—showed tentorial tears, and three of these were accompanied by subdural hæmorrhage; in addition, seven had subdural hæmorrhage without any evidence of tentorial tears. Table I., giving the detailed analysis of these 12 cases, brings out the following interesting points: (1) Six of the mothers were primiparæ, having an average age of 31·3, the average age of the 12 mothers is 32·4; (2) seven of the 12 cases were district cases, five of these being spontaneous deliveries; (3) seven fœtuses were female, five male.

Taking the history of labour, which would be expected to have some relation to the incidence of tears and hæmorrhages, the following classification is found:—

Spontaneous (6 cases).	1 Tentorial tear and hæmorrhage (f.). 1 Tentorial tear only (m.). 4 Hæmorrhage only (2 m.).
Instrumental or manipulation (6 cases).	2 Tentorial tear and hæmorrhage (1 m.). 1 Tentorial tear only (f.). 3 Hæmorrhage only (1 m.).

(*b*) *Premature Fœtuses.*—Of these 33 fœtuses, three—i.e., 9 per cent.—showed tentorial tears accompanied by subdural hæmorrhage, and in addition four had subdural hæmorrhage without any tears.

Table II. gives the further analysis of these seven cases, and brings out the following points: (1) Three

[1] Report No. 7, Ministry of Health, on Causation of Fœtal Death.

TABLE I.—FULL-TIME (F.T.) FŒTUSES.

No.	Sex.	Source.	No. of pregnancy.	Age of mother.	Labour.	Tentorial tears.	Subdural hæmorrhage.	Condition of fœtus.	Estimated maturity.
1046	F.	D.	6	30	Breech, prolapsed cord.	−	+	Dead.	F.T.
1049	M.	D.	1	31	Prolapsed cord.	+	−	,,	,,
1054	F.	R.F.H.	5	32	Prolonged spontaneous.	+	+	,,	,,
1055	F.	D.	11	35	Forceps delivery.	+	−	,,	,,
1059	M.	D.	1	26	Normal.	−	+	,,	,,
1061	F.	E.S.	1	33	Version, forceps.	−	+	,,	,,
2091	F.	E.S.	M.	37	Accidental hæmorrhage, forceps.	−	+	,,	,,
2092	F.	D.	4	40	Born before arrival.	−	+	—	,,
2125	F.	D.	1	38	Impacted shoulder, forceps.	+	+	Dead.	,,
2126	M.	R.F.H.	1	36	Delay, P.P.H., forceps.	+	+	,,	,,
2144	M.	E.S.	1	24	Forceps delivery.	−	+	Lived 10 min.	,,
2150	M.	D.	2	27	Prolapsed cord, R.O.P.	−	+	Dead.	,,

TABLE II.—PREMATURE FŒTUSES.

									Weeks.
1051	F.	E.S.	3	30	Cæsarean.	−	+	Lived few min.	36
2070	F.	E.S.	2	27	Placenta prævia, transverse presentation.	−	+	Dead.	36
2109	F.	E.S.	1	29	Normal.	−	+	Lived 1 day.	36
2149	M.	R.F.H.	M.	27	Induced, posterior position.	−	+	Dead.	38
2151	F.	P.	6	29	Placenta prævia, leg brought down.	+ (small)	+	,,	28
2152	F.	E.S.	1	36	Breech, spontaneous (hydrocephalus, spina bifida).	+ + (+ falx)	+ +	,,	38 +
2155	F.	E.S.	1	21	Placenta prævia, leg brought down.	+	+	Lived 2 hrs.	31

D. = district; R.F.H. = Royal Free Hospital; E.S. = Endsleigh-street; P. = private.
M. = multipara; P.P.H. = post-partum hæmorrhage; R.O.P. = right occipito-posterior.

of the mothers were primiparæ, with an average age of 28·2 years; (2) six cases were from hospital sources, and one private; (3) Six fœtuses were female, one male.

The history of labour, classified as for the full-time fœtuses, is as follows:—

Spontaneous (2 cases): 1 Tentorial tear and hæmorrhage (hydrocephalus, f.). 1 Hæmorrhage only (f.).

Manipulation (5 cases): 2 Tentorial tear and hæmorrhage (f.). 3 Hæmorrhage only, one slight (1 m.).

2. *Further Observations.*

(*a*) *On the 67 Full-time Fœtuses.*—We thought it interesting to note the number of fœtuses delivered by forceps or by manipulation which did *not* show either tentorial tears or subdural hæmorrhage. Of the 67 fœtuses, these numbered 21—i.e., 31·3 per cent.; 16 of the 21 mothers were in-patients, 11 cases being first pregnancies. The average age of the mothers was 31·1 years; 18 of the 21 fœtuses were male. From the histories these were all cases of difficult labour, mostly treated in hospital; the fact that they show neither tentorial tears nor hæmorrhages is significant, especially when compared with the six cases (five of them from "district") of spontaneous delivery which did show such lesions. The total number of non-spontaneous deliveries among these 67 cases is 31; the 21 cases without tears or hæmorrhages just quoted, the six cases with tears or hæmorrhage, and four craniotomy cases.

(*b*) *On the 100 Cases.*—With regard to sex, although among these 100 fœtuses the males were not very greatly in excess of the females (58 male, 42 female), yet we found 23 males and 16 females among the 39 non-spontaneous deliveries.

Non-Spontaneous Deliveries.

	Male.		Female.		Total.
Full time ..	20 + 1 C.	.....	7 + 3 C.	.....	31
Premature ..	2	.....	6	.....	8

C. = craniotomy.

With regard to source, the 100 cases were obtained as follows:—

Gynæcological and Obstetrical Unit—	
(*a*) Royal Free Hospital	25
(*b*) Endsleigh-street	32
(*c*) District	24
Lambeth Infirmary	14
Thavies Inn Hospital	4
Private	1

Seventy-five of the cases, therefore, were hospital in-patients.

Summary.

Taking the full-time and premature fœtuses together, we obtain the following figures:—

	Percentage.
1. Tentorial tears with subdural hæmorrhage ..	6
2. Tentorial tears alone .. .. (i.e., tentorial tears, 8 per cent.)	2
3. Subdural hæmorrhage only	11

These figures are strikingly lower than those obtained by Eardley Holland; we think it probable that neither figure represents the true average, and that this discrepancy is due at least in part to the fact that a sufficient number of cases has not yet been published. No doubt the actual treatment that the patient receives is a factor to be taken into account, and for this reason we have given above the sources of our 100 cases. In this connexion we note that of the 19 cases showing tear or hæmorrhage or both, seven were derived from "district," and five of these were full-time spontaneous deliveries.

It is also interesting to note that 9 (47 per cent.) of the mothers were primiparæ, and, further, that the average age of the mother was unusually high; from the figures we have quoted it appears that the first child of a mother of this class who is already about 30 years old fares badly. In our opinion, among these cases showing tentorial tears and subdural hæmorrhages death could be definitely ascribed to these lesions in one fœtus only, a case of hydrocephalus, which in addition showed extensive tears of the falx cerebri.

We would like to express our grateful thanks to Lady Barrett and to Prof. Louise McIlroy, who have supplied us with 75 of the 100 cases used in this report, and have also been extremely helpful in arranging that full histories are sent with the material. We also wish to thank Dr. A. L. Baly and Dr. J. W. Adams for the remaining fœtuses.

One of us (E. E. H.) is receiving a small grant from the Medical Research Council for research in antenatal pathology.

CROWBOROUGH COTTAGE HOSPITAL.—At the annual meeting on May 16th it was stated that additional rooms for the accommodation of the nursing staff are urgently needed and the committee recommend a special appeal for donations for this purpose. Mr. E. Maude, J.P., said there were certain sums in hand which could be made available for building purposes, but if they spent their invested capital they lost income. The governors, therefore, appeal earnestly for special donations. The balance-sheet showed that the receipts during the year amounted to £1293 11*s.* 10*d.*, the expenditure showing a balance on the year of £38 14*s.* 7*d.*

Clinical and Laboratory Notes.

A CASE OF RECURRENT SUPPURATIVE FRONTAL SINUS DISEASE.[1]

BY E. WATSON-WILLIAMS, *M.C.*, M.CH. CAMB., F.R.C.S. EDIN.,

REGISTRAR, THROAT, NOSE, AND EAR DEPARTMENT, BRISTOL ROYAL INFIRMARY; SURGEON FOR DISEASES OF EAR, NOSE, AND THROAT, MINISTRY OF PENSIONS HOSPITAL, BATH, AND SOUTHMEAD HOSPITAL, BRISTOL.

THE following case is of interest, the patient recovering after a radical operation:—

A clerk, aged 26, in 1921, at Manchester, had the left frontal sinus operated on externally, with removal of front wall of sinus and superior margin of orbit. He had been attending the out-patient aural clinic for some months with slight nasal discharge and occasional headache. By anterior rhinoscopy very little was to be seen beyond a generally soppy condition high up on the left side. Symptoms were not troublesome. On Feb. 27th, 1922, after being in bed for some days with influenza, he had a great "feeling of fullness in the head." This became worse. On March 1st he came to the out-patient clinic very ill, with temperature 102° F., much pain, and an œdematous patch over the left eye 3 inches each way—a regular "puffy tumour." He was sent into hospital that night; the swelling was incised along the scar, but no pus was found. Next day the temperature was down, but the swelling extended from the hair margin on the left temple to the right outer angle of the orbit, rather more on right than on left, up to the hair line and down to orbital margins and bridge of nose. Mental condition was clear, a little slow.

Operation.—Ether was given and I operated. An incision was made from a point midway between the inner canthus of left eye and bridge of nose, along the lower edge of the eyebrow to outer angle; a second across the "spectacle line" of the nose. The flap of skin and scar tissue was turned up, and the frontal bone freely exposed. Creamy pus was found in four situations: (1) around the infundibulum; (2) in a small pit in the centre of what had been the posterior wall of the frontal sinus (the anterior wall had been previously removed); (3) in a high pocket, practically in centre of forehead—through this, infection appeared to be spreading to the right sinus; (4) in a deep lateral pocket, running directly back from *external* margin of sinus to a depth of 1 inch. Although the floor of the sinus had been previously removed, this pocket had a bony floor—i.e., it was in the sinus, not in the orbit. It was necessary to remove bone anteriorly in order to approach this. The whole of the sinus was cleaned out very carefully, the bone being lightly gouged in one or two suspicious places till healthy bone only was left. The floor of the "pocket" (4) was removed. The operation was then continued on right side, where infection had begun (see above) but was not general. A similar deep pocket was found at the external angle. The orbital margin was removed, also the inter-sinus crest and glabella, and the floor of the right sinus was taken away. The anterior ethmoidal cells on both sides were curetted out, a free opening into the nose being obtained. The whole of the exposed bone was rubbed with "bipp," excess being removed, and the wound closed; a small drain was left in above the inner canthus on either side.

Progress of Case.—His condition later was good. The temperature rose the next evening and the next to 100° F., but subsequently the course was afebrile. Healing was by first intention practically throughout the wound—a little oozing at the drains for a few days ceasing without trouble. Convalescence was rather protracted, and it was nearly six months before he returned to work. The condition now, a year after operation, is very good. There is no nasal discharge and no pain, except some aching in bad weather. The cosmetic result is fair—distinctly better than before. An interesting feature is the fact that diplopia, formerly so bad that he had spectacles with one eye obscured, is now only noticed for distant vision; for reading and up to about 10 yards, he has binocular vision.

The point of special interest in this case is the prolongation backwards at the outer angles of both sinuses; the use of "bipp" in the manner indicated gave a very satisfactory result.

[1] A case shown at a meeting of the B.M.A., Bristol Branch, January, 1923.

A NOTE ON DIRECT AND INDIRECT INGUINAL HERNIA ON THE SAME SIDE.

BY HENRY GRIFFITHS, F.R.C.S. EDIN.,

MEDICAL OFFICER, BASUTOLAND, SOUTH AFRICA.

THIS account of a case of direct and indirect inguinal hernia on the same side, which came under my care in June, 1921, appears to be similar to the case recorded by Dr. H. E. S. Stiven in THE LANCET of Oct. 7th, 1922.

The patient, an asthmatic European male, aged 56, consulted me in June, 1921, about attacks of pain in the region of the right groin, associated with vomiting. He had had several attacks, and suggested appendicitis as the cause. He stated that rest in the recumbent position usually relieved him in a few hours.

Examination revealed an "aldermanic" abdomen with a hard lump the size of a pigeon's egg situated just external to and slightly above the external ring. The man informed me that the pain when present seemed to be centred around this "lump" but that the lump had been present for years and had never previously troubled him in any way. I concluded that the swelling was an irreducible epiplocele and that the "attacks" were due to sudden increase in the contents of the sac. I advised him, in view of his general condition, that a truss would probably prevent any further trouble if he could stand its pressure over the lump. While waiting for the truss, and ignoring my advice, he proceeded one day to mount his horse, and was immediately seized with the same pain and vomited once. He went to bed immediately and took two morphia pills. I was called to see him some three hours afterwards and found him "much better." The lump was now slightly tender, but in view of the morphia taken I saw him again three hours later, ordering an enema to be given in the meantime. This produced a good result and I felt satisfied from his general condition that the new protrusion had returned inside the abdomen. The truss arrived shortly afterwards, but he could not wear it because of the pain produced in the "lump" by its pressure. He now begged to have the condition dealt with radically.

I operated a few days later. The "lump" proved to be a very old *direct sac* with a deep deposit of fat on its external surface; its neck was very rigid and it was empty. I excised the sac in the ordinary way and sutured its mouth. Further exploration of the cord now revealed to my surprise another very thin sac three-quarters of an inch in length coming out through the internal ring. This was also dealt with in the usual way. A satisfactory repair of the canal was impossible owing to the atrophy of the muscles, the conjoined tendon being practically non-existent, and I did not think the patient's age justified transplantation of fascia or any other procedure, feeling that a light truss would probably control any further tendency to bulge. He has been quite well since operation.

The case is, perhaps, most interesting from a diagnostic point of view. The presence of the indirect sac, the actual cause of his trouble, was quite unsuspected by me.

LEUKÆMIA IN THE MONKEY.

NOTE ON A SYNDROME IN A MONKEY (CYNOCEPHALUS SPHINX) SIMILAR TO THAT OF CHRONIC LYMPHATIC LEUKÆMIA IN MAN.

BY ALDO C. MASSAGLIA, M.D.,

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IN the course of a series of attempts to transplant leukæmia, Banti's disease, or other diseases of unknown origin into the monkey, by means of transfusion of the blood or inoculation of an emulsion of some hæmatopoietic organs of patients suffering with these diseases, I found a syndrome which I believe is worth relating.

A monkey (*Cynocephalus sphinx*), age not exactly known, weighing 4400 g., remained under observation during November and December, 1922. Repeated examinations gave the following data: Animal apparently in good health; lymph-nodes, especially of inguinal region, very much swollen, firm, but not painful; spleen palpable, showing some tenderness.

Blood examination (average of six examinations performed at different times) gave the following findings: Red cells, 4,000,000 per c.mm.; hæmoglobin, 55 per cent.; leucocytes, 36,000 per c.mm. Red cells appeared in good condition; very few normoblasts were found. The differential count of leucocytes showed: lymphocytes, 65 per cent.; large mononuclears and transitional forms, 17 per cent.; polymorphonuclear neutrophiles, 18 per cent.

The monkey's apparent good health, the considerable enlargement of lymph-nodes, accompanied by slight enlargement of the spleen, the changes in the normal constitution of the blood—moderate diminution of red cells, with a diminution of the hæmoglobin proportionately more marked, leucocytosis due chiefly to an increase of the lymphocytes of the small type—all these data correspond to those which, in man, characterise the disease "chronic lymphatic leukæmia."

In horses, cattle, dogs, swine, and cats cases of leukæmia have been noted (Kitt [1]), but I believe that this is the first case found in a monkey. And probably in the near future, if observations are made more frequently in animals which have the same, or almost the same, composition of the blood as man, we shall find in them several of those diseases which have been hitherto considered limited almost entirely to man.

A CASE OF
ACUTE POLIOENCEPHALITIS IN INFANCY,
ASSOCIATED WITH GLYCOSURIA.

By T. Pearse Williams, M.D., M.R.C.P. Lond.,
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THE following case is of sufficient interest to merit record:—

The patient, a male aged 2½ years, was first attended as an out-patient in June, 1921, when suffering from cough and loss of weight. Sugar and acetone were found in the urine. He was admitted to hospital, and beyond occasional vomiting and an evening rise of temperature to 100° F., no other abnormal signs were present. The weight was 24 lb., and sugar was still present in the urine. Improvement commenced ten days after admission, and after another ten days 25 g. of glucose were given by mouth, without the production of glycosuria. He was discharged from hospital shortly afterwards, no cause having been found for his original glycosuria.

Five weeks later he was again brought to the out-patient department with a history of vomiting, thirst, lassitude, and loss of weight; he was readmitted. Much sugar and acetone were present in the urine, the daily amount of which averaged 20 oz. Weight 26 lb. 10 oz., evening temperature 101° to 103° F. He was placed on a diet containing a very small amount of carbohydrates, and alkalies were administered. Investigation of the blood-sugar showed no abnormal increase.

Ten days after admission weakness and spasticity of the left arm developed, followed rapidly by weakness of the left facial muscles and loss of power with wasting of the left leg. The elbow and knee were flexed and the limbs were not used. Later paralysis of the left external rectus developed. The deep reflexes on the left side were absent and the plantar response extensor. Wasting of the muscles occurred. The weight fell to 22 lb.

Improvement was noticed six weeks after admission, and continued steadily, the diet was increased and weight was gained. A further test of tolerance to sugar was performed, and no sugar appeared in the urine. The facial palsy and squint disappeared, and after massage had been given to the limbs voluntary movement was regained. No glycosuria has occurred since recovery, and except for a mild degree of talipes equino-varus with ½ in. of shortening of the left leg, associated with some weakness, the child is quite well.

I have classified this case as one of polioencephalitis, although there was absence of spasticity in the lower limbs and a residual deformity with some muscular wasting and weakness. There was no evidence either of pancreatic insufficiency or hyperglycæmia.

[1] Kitt: Manuale di Anatomia Patologica degli Animali Domestici, Traduzione di A. Baldoni, vol. ii., 381; Milan: Vallardi.

Medical Societies.

THE MEDICO-LEGAL SOCIETY.

THE MENTAL TREATMENT BILL.

A MEETING of this Society was held on May 15th, Dr. M. A. COLLINS presiding.

Mr. A. H. TREVOR, Commissioner of the Board of Control, read a paper on the Mental Treatments Bill. He said there was practical unanimity in favour of the relaxation of the stringency of the Lunacy Laws, to enable early cases, whether certifiable or not, to be accepted for treatment without certification, and to extend the system of voluntary boarders to all classes. Mr. Trevor selected various clauses in the Bill for explanatory comment, showing first the importance of the extension of the powers of visiting committees. A reduction of the full strength of paid Commissioners from 12 to eight and the delegation of certain duties to inspectors was an economic measure which should receive wide support. Further points of importance were that a patient who regained volition, after having had none, could discharge himself at 48 hours' notice, and that the cost of the keep and treatment of incipient cases would be debited to the General Fund, removing all pauper taint. The Bill dealt only with those willing to be treated, or those who were too ill to know what was taking place. Mr. Trevor explained in some detail the reasons influencing the Government towards placing these patients under the Board of Control. Alternatively a duplicate organisation would have to be set up, for cases of incipient insanity required treatment in many ways resembling that suitable for certified patients. In order to look after their interests, a staff would have to be appointed, differing only in personnel from members of the Board of Control. Separation would also imply the creation of new institutions—a financial impossibility. Moreover, the hospital spirit was growing in public asylums, and this spirit would be damaged by the segregation of early presumably curable cases in a separate institution.

Discussion.

The PRESIDENT said that the aim and object of the Bill must be universally approved. Would the machinery set up attain the desired result?

Sir R. ARMSTRONG-JONES gave as an example of the kind of case that would be benefited by the new legislation that of puerperal insanity, when each successive pregnancy was tinged for the mother with the feeling that she had once been a certified lunatic, and might be again. He regretted that uncertified cases were not to be allowed in approved homes, as well as in public institutions. He did not consider that 48 hours' notice of desire to leave was a sufficiently long period for suitable arrangements to be made. The Bill included no provision for the private affairs of the patient whilst in an institution, and insufficient provision for after-care.

Colonel J. R. LORD was not clear whether visiting committees were to be empowered to combine to provide additional hospitals, like the Maudesley, sanatoria for the treatment of tuberculosis in the insane, and adequate after-care. In New York State certain patients were allowed to resume home life, provided they were visited once a week by specially appointed visitors. These were known as "parole patients," and were also given vocational training. The patient did not leave the books of the hospital until he was fit to look after himself, and until his home conditions were judged suitable. Perhaps some amendment of the Lunacy Act would be framed to achieve this benefit for patients in this country. Provision of after-care should be considered from the economic aspect, lest material help should be given long after the patient had ceased to be insane. The distinction between the voluntary boarders and the

incipient mental cases with volition dealt with in different sections of the Bill seemed arbitrary. According to this Bill every mental hospital might receive voluntary boarders, but only especially approved institutions might receive early incipient cases. Colonel Lord did not consider that every one of our mental hospitals was a proper institution to undertake the care of voluntary boarders. If a patient went as an early incipient mental case, certain formalities were required, but as a voluntary boarder he could go anywhere. If a patient while a voluntary boarder came into a state where volition was lost, he might apparently remain on indefinitely as a voluntary boarder. Thus, when this Bill came into force, the incipient case would have the protection of formal visits from medical men at the end of six months, while a voluntary boarder would not have that advantage. He trusted that the new regulations re inspectors would strengthen, and not weaken, the Board of Control. Colonel Lord considered that, on the whole, the Bill had been admirably framed, but for persons willing and anxious to be admitted into institutions, why so many formalities in recommendation? These were not asked for in the case of a voluntary boarder. He agreed with Sir Robert Armstrong-Jones as to the need for some provision for the care of the patient's property during his stay in an institution. He would recommend the exclusion of voluntary boarders from Section II. and their inclusion under Section IV., so that voluntary boarders and incipient cases would both only go to places approved by the Board of Control.

Dr. M. I. FINUCANE expressed disappointment with the scope and apparent purpose of the Bill, and disapproval of the new machinery set up.

Earl RUSSELL explained that the Bill involved a definite change in policy, extending the available facilities for the treatment of mental disease in two directions—earlier treatment and after-care. Colonel Lord had said in effect that with the new after-care provision, local authorities might maintain neurasthenics for life. So they might, but so they probably did now in certain cases under the Poor-law. It was up to electors to choose representatives who would prevent these abuses. The Bill brought no new apparatus. Earl Russell could conceive of nothing more stupid than separation from the Board of Control. The Bill had been well received in the House of Lords. Doubtless through allowing free egress at 48 hours' notice the Bill might in some cases defeat its own object, but the public had great fear of sequestration in asylums, and the Board of Control was doubtless wise in allowing no power to detain patients against their will. He agreed that 48 hours was a short period, but public opinion rightly demanded stringent safeguards for the liberty of the subject. If in practice the working of the Bill was found to be hampered by any of its provisions, these could doubtless be amended later on.

Sir FREDERICK WILLIS, answering Colonel Lord, said that mental hospitals were only to be used for voluntary boarders with the approval of the Board of Control, and this would be refused if any hospitals were considered unsuitable. As to the overlapping between the sections dealing with voluntary boarders and incipient cases, since 1890 private asylums and registered houses might take in voluntary boarders, but not public asylums. It was a widespread desire that this privilege should be available for the poor also. A voluntary boarder was not necessarily an early case, whereas the incipient case it was hoped to bring in under the new Bill was one of early mental disease; places approved for incipient cases would thus have to be especially well equipped. As to power of combination, visiting committees would be empowered to combine for *any* purpose. The Bill was deliberately drafted to be as elastic as possible.

Dr. J. N. SERGEANT, as a licensee and medical officer of a private asylum, considered that the great value of the Bill was in its brevity. The fact that the faults found in the Bill were mainly those of omission showed that the Bill must be very good.

The PRESIDENT said that the underlying principle of the Bill was to afford to patients suffering from early mental disorders the advantages of patients at a voluntary hospital. For this reason the formalities of recommendation should be reduced to a minimum. One of the most vulnerable clauses in the Bill was perhaps that referring to the non-volition cases, since the state of non-volition was difficult to define.

Reply.

Mr. TREVOR agreed that 48 hours might be rather a short time. In Scotland three days was allowed. As to the approved houses, it might be advisable later to include these, but since these were the only places where any money was made out of the treatment of the insane, it was probably wise not to include them at this stage. As to voluntary boarders, the idea was only to extend to public mental asylums a system which had existed for years in private ones.

ROYAL ACADEMY OF MEDICINE IN IRELAND:

THE ROTUNDA HOSPITAL REPORT.

AT a recent meeting of the Section of Obstetrics held in the Royal College of Physicians, Dr. BETHEL SOLOMONS, the President, being in the chair, the report of the Master of the Rotunda Hospital for the year November, 1921, to October, 1922, was read and discussed.

Dr. GIBBON FITZGIBBON dealt in his report with 1715 women confined in the hospital, 2022 in the extern department, and 412 patients treated in the gynæcological wards. In the district there were ten deaths, of which five were due to post-partum hæmorrhage; in none of these cases was the patient attended by the hospital until after the birth of the infant, and four of the women were moribund when first seen. He pointed out that the present regulations for midwives did not require this complication to be reported early enough, and that consequently assistance often arrived too late. Eleven cases of placenta prævia were treated in their own homes without a death, all by version. This brings the number in three years to 32 with one death; in the hospital there have been 34 with one death. There was one death from concealed accidental hæmorrhage; in this case the true condition was not recognised until collapse set in, and death occurred before treatment could be adopted. One death was due to cardiac disease with failing compensation during pregnancy. In the intern maternity wards 12 cases of prolapse of the cord were treated and seven infants were delivered alive; one only was extracted with forceps, being in the second stage of labour. Reposition was usually the method adopted and spontaneous delivery awaited. Craniotomy was done in a neglected face case and in a case of posterior sacculation of the uterus following ventral fixation. Only four cases are noted in the report as accidental hæmorrhage; these were the only ones requiring active treatment, many other cases having been admitted and treated by rest, the bleeding stopping spontaneously. Two cases of full-term ectopic pregnancies were treated by laparotomy, and also two cases of rupture of the uterus through scars during pregnancy. As to contracted pelvis, there were 138 cases of marked contraction; 104 patients delivered themselves spontaneously, nine requiring forceps at the end of the second stage. Of the remaining 34 cases, Cæsarean section was required 11 times, six cases being repeated sections. The lower segment operation was done in all the cases operated on for the first time. Pubiotomy was adopted in eight cases as an alternative to craniotomy where there was a chance of saving the infant and resulted in four surviving infants, while two others born alive failed to recover. Twenty-eight cases of induction of labour are described in the report. The conditions for which

the procedure was adopted were: severe toxæmia, eclampsia, contracted pelvis, accidental hæmorrhage, and dead fœtus. Dr. FitzGibbon asserts that induction can be carried out with perfect safety and excellent results and offers the most suitable means of dealing with many of the above complications. The methods he adopts are tents where the pregnancy is before the twenty-fourth week and the introduction of a soft rubber tube for more advanced pregnancy. Spontaneous emptying of the uterus is waited for, but where the fœtus has not to be considered, a leg is sometimes brought down after the cervix is dilated to admit two fingers, if the onset of uterine action is slow. The results as regards the child were satisfactory and the maternal convalescence was quite as good as after normal spontaneous deliveries. There were 64 cases of severe albuminuria and 14 of eclampsia without any death. One patient was admitted twice in the year with eclampsia in different pregnancies. The total morbidity in the puerperium (B.M.A. standard) was 6·0 per cent. It was pointed out that this standard includes all cases with a rise of temperature above 100° F. on *any two occasions* between the second and eighth days, not as is often assumed, *two consecutive occasions;* this reading of the standard is erroneous. There were two deaths from acute sepsis and only two other cases showed pyogenic uterine infection, one of these being gonococcal. The intern mortality was eight, including cases of cardiac disease, pneumonia, intestinal obstruction by kink, and one case each of abdominal ectopic pregnancy and ruptured uterus.

Discussion.

In the course of the discussion Dr. L. L. CASSIDY congratulated the Master of the Rotunda and his assistants on a report which, he said, maintained the very high standard which the Rotunda had always shown. He disapproved of the high use of forceps. The question as to when labour should be induced in cases of accidental hæmorrhage was a very important one. In cases of long-continued hæmorrhage, he thought that the blood count should be taken, and if the hæmoglobin dropped to 35 per cent., then he was of opinion that labour should be induced. As to contracted pelvis, if every pregnant woman were examined not later than the thirty-second week, more healthy children would be born.

Dr. R. E. TOTTENHAM was satisfied from the report that there was very strong evidence in favour of inducing labour. There were three reasons indicating such a procedure: (1) the pelvis was too small, (2) it did not give as much as a normal pelvis, (3) the baby's head was too big or too hard. He had looked up old Rotunda reports, and it was interesting to note that out of a total of 115 cases where labour had been induced, there had only been four deaths.

Dr. R. J. ROWLETTE noted that there had been two deaths from acute infection; and in neither of these cases had there been a rise of temperature above normal. They were accustomed to see occasionally, in cases of acute surgical sepsis, death occurring without any rise of temperature, but in his experience of the Rotunda Hospital, he did not remember any deaths without rise of temperature. Dr. FitzGibbon had not mentioned what the infection was, but Dr. Rowlette presumed it was streptococcal.

The PRESIDENT said that habitual death of the fœtus was sometimes extremely difficult to combat, and Dr. Solomons felt that in cases where after induction of labour, a baby was either born dead or died within a week, it might be necessary in a subsequent labour to perform Cæsarean section although these cases must be extremely rare. He did not believe that cephalic version was indicated in breech presentation, as the latter was an effort of nature to bring about the easiest method of delivery. The question as to the exact definition of ante-partum hæmorrhage for statistical purposes had still to be decided. The original views of the Master of the hospital with regard to pubiotomy were valuable, and he was in accord with them. It was questionable as to whether decapitation of a perforated head already born made it easier to deliver the body; it seemed better to have the head still attached to the body for traction.

Dr. FITZGIBBON, in replying, said he thought Dr. Cassidy's suggestion of a blood test an excellent basis upon which to decide the question of termination of labour in persistent bleeding in pregnancy; still, when the patients were under observation the progressive anæmia could be well judged, and by the time the hæmoglobin had fallen to the figure suggested the death of the ovum would be usually established as the indication for induction. Dr. Tottenham's figures from previous reports were valuable, but the four deaths even amongst these cases could not be debited to the induction. The operation was done for many serious complications and often as a last resort. Dr. Rowlette referred to the cases of acute infection without a rise of temperature; the infection was streptococcal and the condition was one of collapse setting in from the time of delivery or even before. Dr. FitzGibbon had met other cases with the same collapse reaction from the profundity of the intoxication and the true condition would not have been established without an immediate post-mortem and cultural examination. Version was not advocated for breech presentation, it was done in a case of contracted pelvis in order to estimate the proportions by Müller's method, and in one other case of twins where the first fœtus was presenting as a free breech. The decapitation after delivery of a perforated head was done as the shoulders had to be reduced, the removal of the head enabling the arms to be brought down easily and the shoulders then reduced.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.

A MEETING was held at the West London Hospital on May 4th, Dr. A. G. WELLS, the President, being in the chair.

Mr. MCADAM ECCLES read a paper on the

After-Treatment of Abdominal Operations.

He said that it had been contended that only one who had experienced an abdominal operation on himself could adequately treat a fellow sufferer. He could speak from personal experience of appendicectomy. Post-operative vomiting was partly due to the general anæsthetic, but not entirely, for he had seen it occur after spinal anæsthesia. His treatment for post-operative emesis was: (1) to allow the patient a pint of hot water to drink, with 5ss. sod. bicarb. dissolved in it; (2) a saline enema of half a pint was slowly given to relieve thirst, and this, if retained, was repeated in a few hours; (3) the patient was propped up with pillows, as this position stopped vomiting. Flatulence after laparotomy might be due to, at least, four causes: (1) purge and enema previous to operation; (2) a preliminary dose of morphine and atropine; (3) excessive manipulation of bowel, causing paresis; (4) too rigid confinement of abdominal patients to the dorsal position. Early flatulence was certainly best relieved by a pituitrin enema. Of great service was a hot fomentation placed over the whole abdomen superficial to a layer of cotton-wool. Solid food should be given as soon as possible. For late flatulence there was nothing better than a good dose of castor oil. Pain after abdominal operations was best relieved by a rectal injection of aspirin gr. x. and sodium bromide gr. xx. As for diet, except where the intestine had been actually interfered with, the sooner the patient had semi-solid and solid food the better. When a drainage-tube had been inserted it should be removed as soon as possible. A tube pressing against the intestine might cause a fistula within 48 hours of its insertion. As for retention of urine, after operation a catheter should never be passed if it could be possibly avoided. Under the strain of coughing or vomiting abdominal sutures might give way; the actual line of suture should therefore be inspected daily.

BRIGHTON AND SUSSEX MEDICO-CHIRURGICAL SOCIETY.

A MEETING was held on May 3rd, Mr. A. J. HUTCHISON, the President, being in the chair.

Dr. H. T. CUBBON read a paper on

Diathermy in Medical Practice.

Medical diathermy he described as the heating through of diseased tissue to a temperature insufficient to destroy the tissue or impair its vitality. The main physiological effects of diathermy were due to its thermo-penetration. The dilatation of the peripheral vessels, increased perspiration, and excretion of solids in the urine aided in the elimination of toxins. The local effects of heat generated in the tissues were to reduce spasm and increase tension with consequent relief of pain. The relief of pain was the most valuable property of diathermy. Subjects of deficient physiological activity of the processes concerned in the production of heat and maintenance of a normal temperature were among those suitable for diathermy. It was an effective method of supplying a supplementary ration of heat in marasmic diseases of children, malnutrition associated with stricture of the œsophagus or cancer of the stomach, and hypothermia following profuse hæmorrhage. Owing to its penetrating power diathermy was useful in the treatment of neuritis and was often of service in relieving the symptoms due to high blood pressure, though the effect appeared to be only temporary. Diathermy was effective in the treatment of pain and spasm due to hæmorrhoids which were not attributable to affections of the liver, heart, or compression of the rectum, and had been found useful in gonococcal infections of the cervix and in gonococcal arthritis before structural changes have taken place. The pain and muscular spasm in cases of lumbago and torticollis of recent origin were often benefited by diathermy, though chronic cases responded better to the constant current. For cases of painful menstruation treatment should be given daily for three days before the expected period and in some cases during the period also. Cases of amenorrhœa for which no obvious cause could be found could often be remedied by diathermy applications of low intensity. The treatment should be given for six days before the period is calculated to be due. Mr. August, of Paris, had had success in treating cases of abdominal pain in which no other lesion beyond adhesions and inflammation of the omentum were present. In coccydynia, great relief and usually complete cure could be obtained by diathermy. One electrode must be placed in the rectum and the other electrode applied externally over to the coccyx. Diathermy must be used with caution in gout; it would be found a useful adjunct to the treatment of infantile paralysis. The temperature of the paralysed limb could be maintained at a normal level by this method and so aid in the restoration of the nutrition of the limb. Until this normal temperature was attained electrical treatment was of little use. Diathermy had been found useful in treating the pain associated with herpetic neuralgia in old patients. Among maladies unsuitable for diathermy were chilblains and Raynaud's disease, which responded better to the constant current. Cases of trigeminal neuralgia did not respond well to diathermy. The treatment of rheumatoid and osteo-arthritis was disappointing.

After remarks by the PRESIDENT, Dr. W. BROADBENT, Dr. HELEN BOYLE, Dr. NEVILLE COX, Dr. G. L. LYON-SMITH, and Dr. J. H. STORMONT spoke, and Dr. CUBBON replied.

Mr. J. R. GRIFFITH then read a paper on the

Treatment of Acute Suppurative Infections of the Fingers and Hands.

He began by expressing his indebtedness to Dr. A. B. Kanavel, who had contributed greatly to our knowledge as to the treatment of these infections. They were dangerous in that they might spread through the lymphatics into the general circulation and also because they might cause local destruction of tissue both by pressure and by cutting off the blood-supply. Treatment was, therefore, directed towards evacuating inflammatory products and relieving tension by means of incisions which did as little damage as possible and did not involve uninfected spaces. Mr. Griffith discussed the advantage of treating infections of the finger pulp by means of lateral incisions and described the method of treating infections of the nail bed by exposing and excising the root, a flap having been formed by making two lateral incisions continuous with the lateral margin of the nail. The treatment of infections of the fascial spaces of the palm and thenar eminence by means of an incision through the web of the finger and by one through the dorsal aspect of the first interosseous space respectively was also described. Collections of pus in the forearm spreading from the hand were usually situated between the flexor aspect of the interosseous membrane and the pronatus quadratus deeply and the flexor tendons superficially. This space might be drained by means of an incision along the anterior margin of either the radius or ulna. This incision avoided important structures. The treatment of infections of the tendon sheaths was then discussed. In the case of the middle finger the importance of providing adequate drainage by means of a long lateral incision was stressed. In infections of the thumb and little finger tendon sheaths the possibility of extension of the infection from one sheath to the other and from a sheath to the neighbouring tissue spaces in the hand and forearm was discussed, together with methods of dealing with these infections and complications. The after-treatment consisted of prolonged arm baths in 2 per cent. saline; early mobilisation was to be encouraged, it did not spread the infection when incisions were adequate.

The PRESIDENT, Mr. H. J. WALKER, and Mr. M. FITZMAURICE-KELLY spoke, and Mr. GRIFFITH replied.

Reviews and Notices of Books.

TEXT-BOOK OF THE SURGICAL DYSPEPSIAS.

By A. J. WALTON, M.S., M.B., B.Sc. Lond., F.R.C.S. Eng., Surgeon, London Hospital; late Surgeon, Poplar Hospital, and Hunterian Professor, Royal College of Surgeons of England. London: Edward Arnold and Co. 1923. Pp. 728. 42*s*.

THIS valuable book should be in the hands of all those interested in the surgical diseases of the stomach, liver, gall-bladder, and pancreas. The author has dived deeply into the literature, which he presents in an impartial and balanced fashion, giving also his own views, based upon considerable personal experience. Where his clinical observations do not support experimental work done on healthy animals, he does not hesitate to say so. Thus he denies that in man V-resection of the stomach interferes with the emptying of the viscus. Indeed, he regards this resection, combined with gastro-enterostomy, as the method of choice for dealing with an ulcer of the lesser curvature. For pyloric ulcer a simple gastro-jejunostomy is recommended. The author seldom performs the Polya operation except for malignant disease. When we come to the section on the gall-bladder, conservatism gives place to radical measures: cholecystectomy is advanced almost to the exclusion of cholecystostomy. There is a good account of the anomalies of the bile-ducts and cystic artery which may be met with and give rise to trouble during the operation. The author's method of repair of an injured common duct is clearly described. A good review of that crippling condition visceroptosis is given. It is questionable whether the operation of complete colectomy should be included in a book of this kind, and we are glad to see that emphasis is laid upon the futility of any of the operations now in vogue for visceroptosis. We

may not agree with all the conclusions of the author, but without exception they are entitled to respect, based as they are upon personal observation and careful clinical work. All surgeons might not be disposed to admit that the several surgical diseases are associated with such distinctive and clear-cut clinical histories as are described here.

The illustrations are hardly up to the standard of the text. The artist in his attempt to portray what the author wishes to be emphasised, has produced rather crude contrasts and has failed to represent the texture of living tissues. But those which diagrammatically illustrate anatomy, or operative steps, are very satisfactory. It may be ungenerous to take exception to the title of so good a book, but it seems too comprehensive. The indigestion of carcinoma of the colon or rectum is just as much a surgical dyspepsia as the conditions described in this book. Mr. Walton must be congratulated on producing a notable addition to English surgical literature.

MINOR SURGERY.

Ninth Edition. By HENRY R. WHARTON, M.D., Surgeon to the Presbyterian Hospital, Children's Hospital, St. Christopher's Hospital, the Bryn Mawr Hospital, and Girard College. London: Baillière, Tindall and Cox. 1923. Pp. 647. 18s.

THE more time passes since the termination of the Great War, the more accurately is it realised how much less it has influenced modern surgery than many war-born surgeons would have us believe. There are, however, certain lessons which no lapse of time will ever efface, and of these two stand out predominant, the treatment of wounds and blood transfusion. In this ninth edition of his work on minor surgery, Mr. Wharton has devoted much space to these two subjects. He deals first with the immediate excision of wounds, their primary or delayed primary suture, and then passes to the treatment of infected wounds—e.g., by the Carrel-Dakin and other modern methods—and finally discusses secondary suture. The indications for and the technique of blood transfusion are fully discussed. There is nothing in the least difficult in this technique provided that the surgeon understands the method of testing the blood groups, but the text is hardly explicit enough in explaining how the groups are recognised. Certain small points in the manual require adjustment. It is out of place in a work of this kind to describe the technique of arteriorrhaphy as a method of arresting hæmorrhage. Again, we notice (p. 481) that the author, in drawing attention to the complications of fractures of the lower end of the humerus, mentions the loss of the carrying angle. The figure on the same page shows the position recommended in the treatment and explains at once why the loss of the carrying angle results. It is not enough to secure full flexion of the elbow, but the forearm must be maintained in full supination at the same time. In practice this is impossible to obtain if the hand is placed over the opposite clavicle as in Fig. 308. Fig. 169 shows a fracture of the shafts of the tibia and fibula, labelled as a separation of the upper epiphysis of the humerus.

The book is well written, freely illustrated, and should prove of great value to those engaged in dealing with minor surgical problems.

X RAYS.

Fourth edition. By G. W. C. KAYE, O.B.E., M.A., D.Sc., Superintendent of the Physics Department, National Physical Laboratory. London: Longmans, Green and Co. 1923. Pp. 320. 16s.

FROM the point of view of the medical radiologist Kaye's X Rays has been for some years one of the best English text-books on the physical side of the subject. It states as clearly as possible with a minimum of mathematics the essence of what has now become a large and complicated science. The present edition is 50 pages longer than the 1914 edition; but even this is a moderate increase considering the amount of productive research work which has been done during the last few years. It is interesting to note that the Coolidge tube during those nine years has changed its position from that of a novelty described in an appendix to that of a routine piece of apparatus entitled to an early place in the straightforward descriptions of X ray tubes.

Much of the present edition has been re-written. The largest alteration is the increased space given to crystal structure. X ray spectrometry, and the X raying of materials in industry. Spectrometry from the medical point of view is of great interest, because in the course of time it may be of supreme importance in regulating the action of X ray tubes for purposes of radiography and treatment. The subject of scattered and characteristic radiation is also becoming of increasing importance to radiologists, so that the fuller, surer, and more systematic treatment of the science of these phenomena in this edition will be appreciated by those concerned in medical work. As the question of the protection of X ray and radium workers is now realised to be a vital matter, more space has been given to the consideration of the best means of shielding the operator; the memoranda issued by the X Ray and Radium Protection Committee are given in full in an appendix.

The book as a whole has kept well abreast of the most recent views on X rays and can be recommended for study to all interested in radiology.

BOTULISM AND FOOD PRESERVATION.

The Loch Maree Tragedy. By GERALD LEIGHTON, M.D., F.R.S.E., Medical Officer (Foods) Scottish Board of Health. London: W. Collins Sons and Co. 1923. Pp. 237. 10s.

Dr. Leighton was commissioned by the Scottish Board of Health to draw up an official report of the food poisoning which caused the death of eight persons at Loch Maree in August last. This report appeared as a white paper. The present book is based upon this report, upon discussions with professional colleagues, and a careful collation of the literature. It purports to be an accurate summary of our present knowledge of botulism and the bearing of that knowledge upon the whole subject of preserved foods. The subject of botulism is considered under the headings of history, cause, symptoms, treatment, and prevention, with a chapter on botulism in animals. The concluding part of the book tells the story of the Loch Maree tragedy.

A surprising amount of exact information is now available, as the author shows, in regard to a subject which until last year interested a mere handful of food experts and bacteriologists. The records show a singularly different ætiology in the two countries to which they are practically limited. Botulism has been known in Germany for the past 130 years, about 1200 cases having been recorded with a mortality of 30 per cent. Its former undue frequency in Würtemberg seems to have been due to sausage being prepared from liver and blood for consumption at a later date, the disease being rare in North Germany, where such organs are only eaten fresh. In America 396 cases are on record up to date, of whom 249, or nearly two-thirds, died, the disease having been traced in almost every instance to home-canned fruit and vegetables. It seems that the spores are very widely distributed, for out of 624 specimens of soil, vegetables, fruits, feeds, manures, and sewage investigated from various parts of California, 30 per cent. of the samples yielded toxic cultures. The bacillus is a strict anaerobe, and the potency of its toxin is terrible, for a dose of 1/40,000th of a cubic centimetre is fatal to a mouse. It is only the toxin which is poisonous to man; the bacillus and its spores do not represent a source of danger even if swallowed, although in experimental animals, injected with calcium chloride, botulism may result. In America it has been officially stated that the toxin itself is destroyed by heating to a temperature of 80° C. or a little less. The spores themselves are as difficult to kill as any known living bodies;

they have resisted boiling for 330 minutes or being raised to a temperature of 120° C. for four minutes, and the spores isolated from different kinds of canned products have exhibited a variation in heat resistance from 10 to 230 minutes.

In America certain rules for the home-canning industry have now been laid down which may be briefly summarised thus: (1) To use only clean, sound, and perfect fruits and vegetables; (2) to inspect the container carefully at the time it is opened; (3) to bring all canned vegetables to the boil after opening; (4) to dispose safely of cans of tins suspected of being bad. And in the case of spinach and ripe olives stringent restrictions have now been imposed upon the preservers. The acidity of the preserve has been shown to be of great moment. Most fruits, as well as tomatoes and rhubarb, are so acid as not to be subject to botulinus spoilage if properly packed; in fact, only products which have a higher acid factor than pH 4·5 need to be carefully sterilised. Dr. Leighton holds that the tin is superior to the glass as a container of preserved foods since the glass container in common use does not lend itself to efficient sterilisation. He puts down the unpopularity of the tin in large part to the difficulty in opening, and he foreshadows a fortune awaiting the individual who invents a tin opener which will do its work with ease and comfort and without risk to the operator.

The book is one which may be read with profit by all who are interested in food preservation. The story is well told and the interest is sustained throughout.

PSYCHOLOGY AND PSYCHOTHERAPY.

Psychological Types: or the Psychology of Individuation. By C. G. JUNG, Dr. Med. et Jur. of the University of Zurich. Translated by H. GODWIN BAYNES, M.B., B.C. Cantab. London: Kegan Paul. 1923. Pp. xxii. + 654. 25*s.*

Jung's work on psychological types and their division into the introvert and the extravert was an extension of observations that had long been common property of philosophers. He shows this in his study of the type problem, where he draws material from classical and mediæval thought, from the theological disputes of the ancient church, and from poet philosophers, before reaching modern thought as expressed by William James and Furneaux Jordan—whose appearance in this company reminds us that one of the most important recent additions to the theory of the herd instinct comes from an English surgeon. Jung now enlarges his classification, and by subdividing in accordance with the basic functions of thinking, feeling, sensation, and intuition, he arrives at no less than eight types; and as he concludes that each type is impelled to seek its own theory of psychic processes, and that each theory must be granted equal validity, he confessedly leaves his readers bewildered. In fact, Jung would seemingly agree to a rough classification of types into those who understand him and those who do not; and those who do not will certainly dismiss a good deal of this book as metaphysical. Still, close reading satisfies one that mankind can be generally classified into his groups, and, since psychologists have to some extent adopted his terminology of introversion and extraversion, his further divisions may find at least a descriptive use. The translator has well performed what must have been a difficult task.

The Psychology of Self-Consciousness. By JULIA TURNER, B.A. Lond., President of the Psychological Aid Society. London: Kegan Paul. 1923. Pp. 243. 6*s.* 6*d.*

THIS is a combination of the writer's personal beliefs with what, in contra-distinction to psychoanalysis, is known as analytical psychology. She divides personality into a perceptual and a conceptual self, finding in the latter a source of philosophical speculation which passes into mysticism. "The purpose of the conceptual life is the mystery of mysteries" (p. 168) prepares us for something speculative, but not for the news, concerning the conceptual subject, that "his life being one of thought and feeling only, it is independent of immediate sensory stimulation," which calls up to the medical psychologist an image of dementia præcox and is, indeed, a conception closely akin to that of schizophrenia. The writer's incursions into medicine may find justification in our tendency, as she puts it, to regard the human economy as merely a piece of physiological mechanism, but she places herself in the category of impossible enthusiasts when (in page 9 et seq.) she seems to believe that the root of all disease is in the mind. The book is sincere, but leads into realms where emotional aspirations replace the prosaic study of causes and effect.

Psycho-analysis and Suggestion Therapy. Their Technique, Application, Results, Limits, Dangers, and Excesses. By Dr. WILHELM STEKEL. Authorised translation by JAMES S. VAN TESLAR. London: Kegan Paul. 1923. Pp. 155. 6*s.* 6*d.*

THE publisher's notice of this book says that it is designed for the busy practitioner and the sufferer from "nerves," but whoever makes it his first acquaintance with the subject will surely reject most of the contents. Dr. Stekel actually has great clinical experience behind his dogmatism, but he hurls the dogma at the unprepared reader in a way that causes aversion. There is good material in the book, and its crudities are partly atoned for by the author's frank discussion of his own difficulties and failures, but its usefulness to the practitioner is doubtful. The suggestion that a book of this nature is suitable for the sufferer from "nerves" is to be strongly condemned.

BRAIN ABSCESS.

Its Surgical Pathology and Operative Technic. By WELLS P. EAGLETON, M.D., President of the Americal Otological Society. London and New York: Macmillan and Co. 1922. Pp. 297. 31*s.* 6*d.*

A SURGICAL text-book to-day may be written for one of two purposes. Its sole purpose may be to serve as a manual of teaching, in which case it will give a complete account of accepted principles, or it may aim at presenting new work and so advancing a special branch of surgery. The work under review does not naturally fall into either category. It certainly does not follow the accepted teaching of the subject, nor does it enter sufficiently into details to be regarded as a monograph of new work. The arrangement of material is open to criticism. In the first two chapters small paragraphs are given to the technique of operation; these are not only useless, but leave the inference that they are the only description given of the author's operation, whereas a fuller account is given on page 40. The pathological considerations in the early part of Chapter III. are sketchy and can be dismissed as padding. The varieties of abscess are classified anew, being described as secondary or adjacent and intercurrent or tertiary. This classification is cumbersome and does not give any practical help. Indeed, it is difficult in reading the book to obtain a clear idea of the subject, for in passing from chapter to chapter there appears to be little or no continuity. There are embodied, however, several important conclusions based upon the author's work. This experience includes a list of 31 personal cases and an analysis of 270 post-mortem records of cerebral and cerebellar abscess.

The most valuable part of the work is that which deals with the differential diagnosis between abscesses with and without a capsule, and the description of the appropriate treatment of each. It makes widely known the fact that every effort must be made to preserve the capsule, and to avoid by trauma infection of the brain tissue. The routine treatment advocated is the formation of a large osteo-plastic flap in the temporosphenoidal region, but it is difficult to see why a superior pedicle is advocated, for the blood-supply is much less satisfactory thus than with the

usual inferior pedicle. The author confesses in a foot-note that the majority of such flaps have been infected when an abscess has been located. The analysis of post-mortem cases is given in the form of two appendixes, but these mainly consist of the author's name and a heading of condition found, although occasionally there is a note of a few symptoms. Although the original descriptions may have been of great use to the author, his abstracts are of small value for reference, as they teach no lesson either good or bad.

The symptomatology is certainly the strongest part of the book, and from this aspect the work will be found useful to those engaged in this branch of surgery.

A MONOGRAPH ON GONORRHŒA.

By A. REITH FRASER, M.D. Aberd., Lecturer in Venereal Diseases, Cape Town. London: Henry Kimpton. 1923. Pp. 508. 18s.

THE author says in his preface: "This monograph is frankly a plea for the conservative treatment of gonococcal urethritis and for the management of gonorrhœa as a general systemic disease instead of a local specialised catarrh." Further on he expresses the hope that the book will stimulate new lines of thought, dispel old and mistaken dogmas, or replace certain accepted conceptions in their true perspective. After this it is a little disappointing to find a text-book on gonorrhœa without any very new ideas or methods and not including all that is known to date on the subject.

The treatment is laid down in discursive fashion. It is sound enough, but the manner is not concise and not always clear—for instance, Dr. Fraser advises giving a patient in the acute stage in place of novels some heavy work requiring thought and concentration relating to his trade or profession, and two pages later advises against "all active exercise." In the matter of posterior gonorrhœa space is wasted in tilting at the mythical person with a mania for urethroscopy. The section dealing with gonorrhœa in the female is too sketchy to be of value to the serious reader and might have been omitted. The main teaching of the author seems to be caution in treatment—a sound dogma, but apt to be overdone. Dr. Fraser is an enthusiast for vaccine therapy.

There is much that is of value in the book, but it contains too many general statements and too little that bears the stamp of personal experience.

GLANDS IN HEALTH AND DISEASE.

By BENJAMIN HARROW, Ph.D., Associate in Physiological Chemistry, College of Physicians and Surgeons, Columbia University. London: George Routledge and Sons, Ltd. 1922. Pp. 218. 8s. 6d.

"MONKEY glands; clever men and stupid ones; glands as the cause of crime; the origin of races; the mentally unbalanced; many acute diseases; 'the bearded lady, the giant, the fat boy, and the midget'—all these and more have been dealt with under the subject of the glands of internal secretion." The present volume, though only of an elementary standard, contains a great deal of sound information presented in an interesting manner; it is suitable for either the general reader or for the practitioner who wishes to obtain trustworthy views on the subject, but has no time for heavier treatises. The book contains no reference to the recent work on the internal secretion of the pancreas, no doubt because this appeared while it was in the press—an illustration of the kaleidoscopic nature of the subject. In the chapter on the reproductive organs we have an interesting presentation of the rejuvenation methods—the putting of "new wine into old bottles"—which has of late attracted some attention. These methods are vasectomy, exposure to X rays, and transplantation of testis. Of these methods, that of vasectomy is most favourably viewed, because it results in actual hypertrophy of the interstitial tissue of the subject's own testis. The effect of X rays is less certain, while with grafts the improvement ceases as soon as the graft has all been absorbed.

We congratulate the author on producing a sensible book for popular use.

THERAPEUTISCHES VADEMEKUM FÜR DIE KINDERPRAXIS.

Fourth and fifth edition. By H. KLEINSCHMIDT. Berlin: S. Karger. 1923. Pp. 227. M.3.

Prof. Kleinschmidt, who directs the Children's Clinic at Hamburg University, first published this compilation in 1918. A short preliminary section on the general principles of treatment in children's diseases is followed by 24 pages on the subject of infant feeding in health and illness, breast-feeding, as well as "unnatural" or artificial feeding, receiving brief but adequate attention. Useful chapters on the diseases of the new-born and on disorders of nutrition in the infant are introduced, but the main portion of the book consists of a synopsis of treatment, the diseases being grouped alphabetically under the various organs or systems mainly affected. A subject-index obviates any difficulty in cross reference. Prophylaxis as well as treatment is considered, and occasionally attention is drawn to symptomatology where difficulty may arise, as in the differential diagnosis of myelogenous purpura. The therapeutic measures advocated are representative of current medical practice on the Continent. This is especially the case where serum-therapy is concerned—e.g., the injection of serum from a convalescent case is recommended both in the prophylaxis of measles and in the treatment of severe cases of scarlet fever. In the section on diphtheria, however, while recommending that the brothers and sisters of the patient should be protected by the intramuscular injection of 500 units of antitoxin, Prof. Kleinschmidt makes no mention either of the preliminary Schick test, which should always be carried out where possible in children over 3 years of age, or of the toxin-antitoxin method of immunisation, which is so largely used in America, and is believed to confer a very much longer period of immunity than the three weeks' protection afforded by the author's method—omissions which might be remedied in a future edition. The important place of diet in the treatment of many diseases is emphasised, and a number of simple recipes included.

A vast amount of information has been compressed into the 227 pages of this useful volume.

BOOKS FOR NURSES.

A Handbook for Mental Nurses. Seventh edition. Published under the authority of the Medico-Psychological Association. London: Baillière, Tindall and Cox. 1923. Pp. 640. 6s.

A COMMITTEE of the Medico-Psychological Association has been at work for two years in producing this book. Each section of it has been rewritten either by a member of the committee or by an authority appointed by them, and subjected to close scrutiny and revision at the meetings which have taken place since the committee was set up in 1920. The result is a volume of much greater length and scope than its predecessors. It occupies a unique position among text-books of mental nursing, for not only is it adequate to the needs of nurses at any stage of their training, but it carries an authority which no text-book by any single individual could possess. There are no small difficulties in producing such a work. Every mental nurse is intended to possess it, and a mental nurse may be either a highly intelligent and cultured woman with a previous general hospital training, or a man or woman lacking in some of that mental equipment and with no previous experience of any kind of nursing. The same mode of address is not appropriate to each of these individuals. The introductory chapter on the general conduct of a nurse, for example, was evidently written with the latter type in view, whereas some of the later sections presuppose for their proper understanding a much

higher degree of general intelligence and education. This inequality is not only a natural effect of multiple authorship; to some extent it is inevitable in dealing with subjects ranging from matters of the merest common-sense to academic psychology.

Another aspect in which compromise was inevitable is the treatment of general nursing matters. To have made these sections complete would have been to produce two text-books in one, and to go beyond the present scope of a mental nurse's training. On the other hand, to omit brief descriptions of common diseases and their nursing requirements was impossible. An example of what this means is to be found in the paragraph on diphtheria. The only instruction given as to the preparation for tracheotomy and subsequent dressings is to have at hand a plentiful supply of sterilised feathers. The remarks on the nursing of typhoid and rheumatic fever are also too brief to be of service; a nurse responsible for such cases would be compelled to consult other works, or to depend entirely on the instructions of a medical officer. Such patients would, of course, often be placed in the care of nurses with a general training, and the real question underlying the whole matter is whether asylum nursing staffs should not be recruited to a greater extent from those who have undergone such training elsewhere, or, on the other hand, whether facilities should not exist for providing a larger number of mental nurses with training at a general hospital at a later stage in their careers.

A still wider question is exemplified in the sections which treat of psychology, and the anatomy and physiology of the central nervous system. The descriptions given of such structures as the spinal tracts and the basal nuclei would appear formidable at first sight even to the medical student. It is, however, impossible to describe the mechanism of the nervous system in a manner so simple as to be understood immediately by an uninstructed reader, however intelligent. Although the scope of the handbook corresponds to that of the syllabus of training for mental nurses laid down by the Association, it is not implied that an exact knowledge of everything contained in the handbook is required. The more difficult and theoretical sections are inserted for the benefit of those who are inclined to the study of this aspect of their subject, and the handbook is therefore to be regarded as a work of reference as well as a text-book.

The chapters dealing with insanity, and with the practical aspect of mental nursing, are beyond criticism and beyond praise. The care with which the preparation of this edition has been undertaken is reflected in its up-to-date and accurate information, in its clear style, and in the attention to practical points.

Text-book for Fever Nurses. By GRACE H. GIFFEN DUNDAS, F.R.C.S.I., D.P.H. Camb. Edinburgh: W. Price. 1923. Pp. 202. 4*s.* 6*d.*

Mrs. Dundas's small book on fever nursing is useful as far as it goes, but it does not go far enough; of the 202 pages, 89 only are devoted to infectious fevers. There are so many excellent books on anatomy and physiology that the eight chapters devoted to these subjects might well have been omitted in favour of some account of typhus, cholera, and infective diarrhœa, which would have been invaluable to those hoping at some time to nurse abroad.

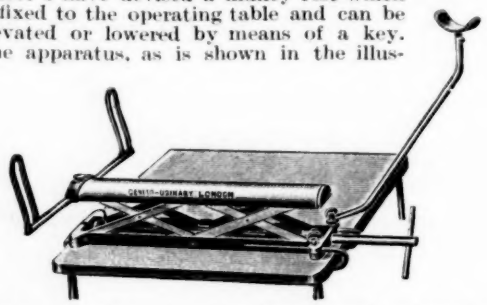
C.M.B. Examination: Questions and Model Answers. A Handbook for Nurses entering for the Central Midwives Board Examination, with Abridged Rules and other Useful Information. London: The Scientific Press, Ltd. 1923. Pp. 125. 1*s.* 6*d.*

THIS little book not only contains model answers to questions set at the Midwives Board examinations, but also information on how to become a midwife, institutions, &c., at which pupil midwives may be trained, an obstetrical table, and the rules of the Central Midwives Board abridged. The model answers to the questions are well arranged and thorough, and should prove useful to nurses taking these examinations. The volume as a whole is an excellent little publication.

New Inventions.

A NEW KIDNEY REST.

THE many contrivances which have been made use of in kidney operations for the purpose of maintaining an anæsthetised patient in the lateral position, and at the same time widening the interval between the lower ribs and the crest of the ilium, suffer from the common defect of having to be placed in position after the patient is unconscious. To avoid this defect I have devised a kidney rest which is fixed to the operating table and can be elevated or lowered by means of a key. The apparatus, as is shown in the illustration, consists of a flat base trough adapted to lie transversely across the operating table with a pair of hooked clamps at each end to grip the table edge; one pair of these clamps is extensively adjustable to accommodate the device to various widths of table. A rotatable spindle is mounted in the trough having right and left screw threads at each end respectively and a rounded elevating table is carried by trellis links connected to the base and to brackets running on the opposite threads of the spindle, so that rotation of the spindle contracts or expands the trellis and raises or lowers the elevating table. The whole elevating mechanism lies concealed between the flat base trough and elevating table. A back-rest is fixed to the elevating table by means of a stirrup-shaped clamp and can be easily removed; while an arm support is detachably connected to the base on the opposite side. The apparatus weighs 12 lb. and can be put into a wallet 20 in. × 6 in.



The rest is made by the Genito-Urinary Manufacturing Company, Ltd., 66, Margaret-st., London, W.

CLIFFORD MORSON, O.B.E., F.R.C.S. Eng.
Welbeck-street, W.

AN IMPROVED OPHTHALMOSCOPE.

HAVING used an ordinary electric ophthalmoscope for some time, I found that if the light was sufficiently powerful to see the disc in an ordinary room there was a haze round the slot in the mirror, and also from the transverse beam. I tried various forms of mirrors—glass, steel, and silver—but could not obviate this haze and back light from the slot. I then tried building a small hood round the slot, but found this interfered somewhat with the vision. As a last resort I decided to try having a glass prism slotted. This I entrusted to Messrs. George Spiller, Ltd., who took a careful interest in the work, and produced a small silvered prism, with a slot for vision. With this they have now made for me an ophthalmoscope, from which there is no back light or haze, so that the light can now be much stronger, and a good view of the disc obtained in full daylight.

D. N. HARDCASTLE, M.R.C.S., L.R.C.P., D.P.M. Cantab.,
Neurological Specialist, Ministry of Pensions.
Bushey, Herts.

THE LANCET.

LONDON: SATURDAY, MAY 26, 1923.

ANTE-PARTUM HÆMORRHAGE.

HÆMORRHAGE from the gravid uterus during the last three months of pregnancy is one of the gravest of all obstetric complications. It is sufficiently frequent for every practitioner of midwifery to see a fair number of cases, and its importance as an integral factor in the mortality of childbearing is shown by the figures to be found in the Registrar-General's Reports for England and Wales. Since the year 1915 deaths from placenta prævia have been separated from the other "puerperal hæmorrhages" as they are entitled in the reports, and it appears that about 200 deaths from placenta prævia alone occur every year. The deaths from accidental hæmorrhage are not given separately, but it will not be far off the mark if we assume that from 300 to 400 women lose their lives in England and Wales every year from ante-partum hæmorrhage. It is impossible to form any accurate estimate of the frequency of its actual occurrence since the requisite data do not exist; only the cases which end fatally are on record. We know, however, what numbers of cases of ante-partum hæmorrhage are admitted to our lying-in hospitals; these are, generally speaking, the most severe cases, and one or two interesting points may be gleaned from a study of the annual reports of these hospitals. Ante-partum hæmorrhages appear to be much more frequent in the practice of hospitals serving industrial districts than in London. Thus in a London lying-in hospital (Queen Charlotte's) over a recent period of five years the numbers were 21 cases of ante-partum hæmorrhage per 1000 cases admitted; in a Midland industrial district (Birmingham) they were 85 per 1000 cases admitted, and in a third hospital serving a northern industrial district (Manchester), 58 per 1000 cases admitted. Perhaps the larger proportion of women engaged in fatiguing occupations in the industrial towns accounts for the higher number of severe cases of ante-partum hæmorrhages occurring in those districts. All the reports agree that placenta prævia is more frequent than accidental hæmorrhage, the proportion varying from 55 per cent. of the total in London to 75 per cent. in Birmingham; the mean relative proportion is about five cases of placenta prævia to four of accidental hæmorrhage. The relatively high proportion of cases of accidental hæmorrhage in London (45 per cent., as compared with 25 per cent. in Birmingham) is surprising and very difficult to account for. The relative severity of the two kinds of ante-partum hæmorrhage is also curiously unequal in the different districts, as will be seen from the following rates of maternal mortality:—

	Maternal mortality.	
	Placenta prævia (per cent.).	Accidental hæmorrhage (per cent.).
London	7·3	1·2
Birmingham	4·6	3·1
Manchester	7·2	9·6

The high mortality of accidental hæmorrhage in Manchester and its very low mortality in London are interesting points which would perhaps repay further inquiry. The average mortality rate of placenta prævia over these total figures is about 6·7 per cent. and that of accidental hæmorrhage about 4·6 per cent., the former being thus nearly 50 per cent. more dangerous than the latter. This relation probably expresses fairly accurately the comparative severity of these two forms of hæmorrhages.

The classification of cases of ante-partum hæmorrhage, in accordance with the situation of the placenta, into *placenta prævia* (or unavoidable hæmorrhage) and *accidental hæmorrhage* is universally adopted in all countries and is of great practical value. The importance of endeavouring to arrive at a differential diagnosis, the value of which is often underrated by practitioners, lies in the fact that the treatment of the two conditions is by no means identical. The difference in treatment depends upon three important points of difference in prognosis. First, in a case of placenta prævia labour rarely ensues upon the first hæmorrhage; repetition of the hæmorrhage is certain to occur, and a sudden profuse bleeding may at any moment bring the patient to a point of extreme danger; in a case of accidental hæmorrhage, on the other hand, labour more frequently accompanies or rapidly succeeds the first hæmorrhage; if labour does not set in and pregnancy continues, it is quite possible that no further bleeding will occur, and normal labour may bring the case to a favourable termination, either prematurely or even at term. Secondly, the delivery of the patient in cases of placenta prævia is a much more difficult obstetric problem than in accidental hæmorrhage. Thirdly, the maternal mortality of the former is, as we have seen, 50 per cent. greater than that of the latter.

In the twenty-first article of our series on modern technique in treatment Dr. T. W. EDEN sets forth the considerations which should influence decision on the line of treatment to be adopted in ante-partum hæmorrhage from either cause. It is clear that the presence or absence of albuminuria is a vital point, and one of the first things to be done by a practitioner confronted with a case is to secure a catheter specimen for examination. Accidental hæmorrhage is accompanied in about 80 per cent. of cases by albuminuria, frequently also by other toxæmic symptoms, such as œdema, headache, and vomiting. In other words, a toxæmic condition is present, which is probably the essential cause of the hæmorrhage from the placental vessels, and eliminative treatment is therefore indicated. If all cases of accidental hæmorrhage could be kept under continuous observation after the first attack of bleeding, and prophylactic treatment diligently carried out, the mortality would probably be greatly reduced and few really serious cases would be seen. In this respect accidental hæmorrhage differs from placenta prævia, where prophylaxis is impracticable. The bleeding results from the vicious situation of the placenta in the lower uterine segment, and since its recurrence is unavoidable there is no object in temporising. In a case where labour has not begun the problem resolves itself into the choice between induction of labour and Cæsarean section, and Dr. EDEN indicates the main facts which ought to influence the decision. In discussing the methods to be adopted when hæmorrhage occurs during labour he excludes the use of de Ribes's bag except in hospital practice and under limited indications. This is indeed a method of dilating the cervix rather than a method of delivery. It is alleged to give a better chance of survival to the infant, but this has not been proved, and since it has certain disadvantages in comparison with podalic version the latter is likely to be favoured by most practitioners. The principles

which should be applied in the treatment of cases of different varieties of ante-partum hæmorrhage are most clearly set out by Dr. EDEN, and his article should be of great assistance to those engaged in the practice of midwifery.

THE SUPPLY OF INSULIN.

ON April 21st, 1923, the Medical Research Council published a statement setting forth the steps that had been taken to make insulin available for use in this country. At that time the supplies of insulin were inadequate to meet the demand that might be expected, and it became necessary to secure that the limited quantities available should be distributed to the best advantage. The question was submitted by the Council to the Minister of Health, who appointed a Committee composed of Sir GEORGE NEWMAN (chairman), Dr. R. A. BOLAM, Sir WALTER FLETCHER, Sir HUMPHRY ROLLESTON, Dr. ALFRED SALTER, M.P., Dr. MCCLEARY (secretary) to advise him on distribution. On the advice of the Committee the manufacturers were directed during the period of restricted production to supply insulin for use in this country only, and to those hospitals and to those registered medical practitioners who undertook to observe certain defined restrictions upon the use of insulin. The following additional statement can now be made. During the past four weeks the productive capacity of the British firms has considerably increased, and it is no longer necessary to maintain the restrictions upon the supply of insulin, which, therefore, may now be obtained from the manufacturing firms through the ordinary commercial channels. But the Council consider it advisable again to remind the members of the medical profession, who desire to use insulin, of the great importance of making accurate blood-sugar determinations, of correlating the diet, the blood-sugar changes and the insulin dosage in each case, and of avoiding the danger of giving insulin in cases of renal glycosuria or other non-diabetic conditions.

We publish in THE LANCET this week an address delivered by Prof. HUGH MACLEAN before the Congress of Public Health at Scarborough on the present position of medicine in the diagnosis and treatment of glycosuria. He shows how newer methods in investigating glycosuria have made possible a classification of the cases presenting glycosuria as a prominent symptom, and makes it clear that a study of blood-sugar reactions is necessary for scientific therapeutics. The value of insulin, and the general outlook for its employment, are outlined at the termination of an interesting exposition of the whole subject, and Prof. MACLEAN'S conclusions exactly support the words of advice closing the statement of the Medical Research Council. He notes that blood-sugar determinations must be taken with great care by those who employ insulin, and that diet must always be correlated to insulin dosage, for only in this way can there be any reasonable certainty that it is right to administer the product, or that the procedure will be perfectly safe for the patient. For insulin is a powerful remedy, and in the hands of inexperienced users serious difficulties may arise during its exhibition.

We are glad to announce that insulin can henceforth be obtained through the usual commercial sources, and may take this opportunity of congratulating alike the Medical Research Council and the manufacturing firms concerned on the results obtained. When the Council accepted from the University of Toronto the exercise of protecting powers and controlling discretion in the matter of the production and distribution of insulin there was some criticism of the position produced, as being foreign to medical tradition. But we feel assured of two things. The intervention of the Council has enabled a supply of the standardised production to be far more promptly available than would otherwise have been the case, while the risk of valueless imitations being put upon the market has been avoided.

VISCEROPTOSIS.

THE excellent survey of visceroptosis given in Mr. A. J. WALTON'S "Text-book of the Surgical Dyspepsias," which we review in another column, recalls attention to a morbid entity of no little complexity. Since GLÉNARD first described the condition of dropping of the abdominal viscera, to which his name is often applied, a great deal has been written on the subject, but there is as yet no consensus of opinion as to its nature, causation, symptomatology, or treatment. Even its nomenclature is protean and confusing. Glénard's disease, enteroptosis, and splanchnoptosis have been used to express the general condition of sagging of the abdominal viscera, while the terms gastroptosis, hepatoptosis, nephroptosis, coloptosis, and uterine prolapse show how the displacement of individual organs has attracted attention. The comparatively recent name of visceroptosis, though perhaps not elegant, is expressive and comprehensive. At any rate it may serve to emphasise the fact, which should be obvious, that the whole includes the parts, and that the condition is usually general not local. The history of this condition makes somewhat melancholy reading. There has in many instances been a lack of true perspective in its consideration. The various operations proposed to deal with individual displaced organs have had their vogue and have, for the most part, failed to establish their value, except in a few well-recognised mechanical results of the sagging. That the condition of visceroptosis may be associated with most profound discomforts and disabilities is familiar to most practitioners. On the other hand, it is becoming recognised, since the wide use of X ray examinations of the abdominal viscera, that very marked dropping of the intestines, and especially of the colon, may be consistent with sound health and active bodily functions.

Visceroptosis has recently been the subject of discussion at the Chelsea Clinical Society and the report of the debate, which was published in THE LANCET of April 7th (p. 698), well illustrates the differences of opinion which still exist in regard to this condition. The opener, Sir CHARLTON BRISCOE, maintained that the visceroptotic habit or tendency was produced early in life. He suggested that conditions which tended to induce predominant abdominal respiration helped to develop visceroptosis. He urged due attention to such matters as the position of children at desks, nasal obstruction from adenoids, and frequent colds, fatigue, and over-exercise. He also advised proper exercises and measures to develop the upper chest. Mr. IVOR BACK questioned whether visceroptosis existed as a pathological or clinical entity, and cogently pointed out how our views of the normal position of the viscera, as studied by the X rays, had rendered it necessary to modify the older views obtained from

dissection and from formalin-hardened bodies. He referred to the practical discrediting of nephropexy except for comparatively rare cases in which the dropping of the kidney was mechanically responsible for the symptoms produced, as in Dietl's crises, and he suggested that the operation of colopexy would prove to have a similarly limited field of usefulness. Dr. ROBERT HUTCHISON, in a noteworthy contribution to the discussion, claimed that visceroptosis was a definite clinical entity, but pointed out some of the difficulties in connexion with it, notably its almost constant association with neurasthenic manifestations and the fact that it not infrequently produced symptoms simulating acute organic abdominal disease such as gall-stones or gastric ulcer, while on the other hand it might be present without symptoms. Dr. HUTCHISON criticised the views expressed by Sir CHARLTON BRISCOE as to causation, suggesting that in women, in whom the condition was most often found, diaphragmatic breathing was less common than the thoracic type. He thought that the size of the pelvis in women and derangements of its floor, particularly as a result of pregnancy, were of more importance, together with a loss of the supporting fat within the abdomen. He suggested that the symptoms developed when atony of the visceral muscle resulted, or when weakness of the abdominal muscles led to diminished intra-abdominal tension. He recommended the adoption of measures to strengthen the abdominal walls and to repack the abdomen with fat. He thought that the relief sometimes afforded by belts was not due to the holding up of the viscera but to the increasing intra-abdominal tension. Several of the speakers maintained that visceroptosis was of congenital origin. Dr. F. HERNAMAN-JOHNSON recognised two types: one commonly following pregnancy and due to laxness of the abdominal walls, this form being preventable by suitable precautions and treatment; the other type, which he regarded as congenital, occurred in tall, thin women. Dr. J. CAMPBELL MCCLURE, the President, referred to the two opposing innervations of the alimentary tube—viz., the vagus and the sympathetic—and believed that a lack of balance between these innervations might result in gastro-intestinal stasis, and was anyhow an important factor in the production of symptoms.

The chief outcome of the discussion is to emphasise the gaps in our knowledge of visceroptosis and the far from satisfactory means of treatment at present available. That there is a need for individual and collective research must be obvious. The one point of general agreement seems to have been that the rôle of surgery in the treatment of this condition is a strictly limited one. The plea put forward by several of the speakers for preventive measures in the form of proper rest and support after pregnancy and for means to improve the abdominal musculature and visceral tone of those prone to the disease, deserves careful consideration. The concomitant nerve manifestations and the neurasthenic state, so often associated, received but little consideration. They constitute perhaps the most troublesome and distressing features of the condition. They are difficult to explain and still more difficult to treat. It is probable that the complex symptomatology is due to various combinations of mechanical, toxic, nervous, and endocrine factors. The recognition of the rôle of each of these and the determination of their relationship to one another should do much to clear up the causation and pathology of the condition. This discussion should stimulate fresh endeavours to put treatment on a more satisfactory basis.

Annotations.

"Ne quid nimis."

THE LISTER INSTITUTE.

THE annual report of the governing body of the Lister Institute of Preventive Medicine was presented at the general meeting of members on May 16th, and gives an interesting summary of the activities of that institution; some of the results of the original work done by members of the staff and others working there have also recently been distributed in the annual volume of collected papers. Among a great variety of important topics, the chief place is taken by the investigation of accessory food factors. On the experimental side the work of Prof. Korenchevsky, Dr. Goldblatt, Miss Hume, and their collaborators on the relation of diet to growth and rickets in rats will be familiar to our readers, and in the more difficult clinical field Dr. Harriette Chick, Dr. Dalyell, Dr. Mackay and their co-workers achieved a considerable advance in our precise knowledge of human rickets at Prof. v. Pirquet's Kinderklinik in Vienna. Prof. Harden, Dr. Zilva, and Dr. Schütze have also been engaged on various aspects of vitamin problems. The department of bacteriology under Prof. Ledingham has investigated diphtheroids, tularæmia, typhus, blood-platelets, streptococci, the bacteriophage, protein therapy, the carriage of cholera vibrios by ship cockroaches, the relationships of the bacilli of bovine abortion, and Malta fever among other subjects. At the serum department at Elstree Dr. MacConkey has been chiefly engaged in the stability of toxin and antitoxin standards and the concentration of antitoxin sera. As many working bacteriologists could testify, the National Collection of Type Cultures, established at the Institute with the help of the Medical Research Council, has been a great success. Among much happy progress, there are unfortunately several deplorable events. Chief among these is the loss of that wonderful disciple of true learning, Mr. A. W. Bacot, who died of typhus contracted in Egypt during his work there on the disease; Dr. Arkwright also took it, but fortunately recovered. In maintaining the virus of the Californian disease, tularæmia, in the Type Collection, Dr. Brooks, Dr. Schutze, and Miss Rhodes all caught the infection, as have most people who have worked with it. We notice, too, with regret that the University of London appears to have now entirely withdrawn its support of the protozoological laboratory, and the absence through illness of Dr. Robertson is also mentioned. In face of a good many difficulties, however, the work of the Institute has continued to progress on the high level which it has set and Prof. Martin is to be congratulated on another successful year. The financial position is satisfactory in so far as there is a balance on the right side; but about two-thirds of the money which is spent in maintaining research has to be earned in a rather precarious market by the manufacture of sera, &c., and this uncertainty of income naturally hampers the governing body in embarking on any fresh schemes which involve any lasting financial responsibility. Twenty-nine years of service so good as that which the Institute has given to the cause of preventive medicine deserve a more comfortable stability.

SYPHILIS OF THE SECOND AND THIRD GENERATION.

BESIDES the ordinary congenital syphilis of the first generation which parents transmit to their children there are other much rarer forms in which the disease is transmitted from the grandfather to the grandchildren, or from the great-grandfather to the great-grandchildren. Observations, which are not numerous but of great interest as coming from authoritative sources, appear to leave no doubt as to the existence of

this form of hereditary lues, and while Brunisgard expresses the opinion that this form can only be transmitted by a mother who is definitely syphilitic, yet Gaucher, Clover, and others have shown that the heredity can also be transmitted by a father or by both parents. Prof. Carlo Martelli, of the University of Naples,[1] has collected nine cases which disclose further interesting facts regarding this condition and from which it appears that though it is easy to understand a toxic, dystrophic, and non-parasitic transmission from the grandfather to the grandchild through the father, these cases do not imply a virulent syphilis in which transmission is connected not with toxins but with active treponemes. In Prof. Martelli's cases relating to numerous grandchildren of various grandparents and great-grandparents, nearly all of maternal origin, there is almost always found a vigorous defensive humoral reaction with presence of antibodies in the serum and a strongly positive Wassermann reaction. In most of the cases the subjects of syphilis of the second generation are weak, prone to all those ailments which easily conduce to a fatal result—and sometimes without appreciable cause, disposed to general dystrophies, such as infantilism, dwarfism, and dental malformation; but on the other hand cases are not wanting, like those described by Prof. Martelli, in which the grandchildren are found possessed of all the best somatic and psychic developmental endowments, so that only an accurate investigation is successful in revealing the slight anatomical and functional stigmata of the disease transmitted by the grandparents. Rarer than hereditary syphilis of the second generation is that of the third generation, in which the great-grandfather transmits the disease even to the great-grandchildren. Such an event requires a lapse of so much time that the opportunity of following it to its conclusion is rarely afforded, yet a case of this character exists in literature and was communicated by Gaucher to the Academy of Medicine of Paris in 1916.

In this case the great-grandfather died of syphilitic paraplegia, according to reliable information furnished by the son; the grandfather, personally known, had numerous stigmata of hereditary syphilis and died of cerebral hæmorrhage; the father was healthy and had never contracted syphilis yet gave a positive Wassermann reaction. He married a woman with negative reaction and had three children affected with hereditary syphilis, one, a girl aged 9 years, with scoliosis, adenoids, and notched incisors, another, a girl of 6 years, almost an imbecile, with flat nose, uneven teeth, and convergent strabismus.

One of Prof. Martelli's cases carries this form of familial syphilis as far as the fourth generation.

The great-great-grandfather suffered from dementia of specific origin, his daughter (the great-grandmother) died at the age of 75 from biliary calculus, having married a widower, who died of diabetes, but was free from syphilis and had had three healthy children by a former wife. This marriage resulted in 16 pregnancies, four being abortions and four dying at an early age; two others became grandmothers one of whom had a strongly positive W.R. and married a healthy individual, giving birth to seven children, three of whom died at an early age, one had spinal neurasthenia, another died of œdema of the glottis, and a third had rickets; the remaining child, who was clinically healthy, yet had a weakly positive W.R., married a healthy man and had three children, one of whom suffered from dwarfism, another from hernia, the third beirg as yet unborn. Of the second generation, three became mothers; one having a weak positive W.R. gave birth to two normal children and to one mentally deficient and one with a weak positive W.R. The second mother having a strongly positive W.R. had two children, one of whom died at the age of 2 years from convulsions, while the other was apparently normal. The third mother had a strongly positive W.R. and gave birth to four children, one with adenoids and notched incisors, two with adenoids, while the fourth was a degenerate.

Like alcoholism in the Rougon-Macquart family, so syphilis sends down its stigmata to the third and perhaps fourth generation. It may not conform to the classical description, but descends among the offspring and infiltrates everywhere to a more or less extent without following fixed laws and, more often than not, without giving rise to any specific manifestations, such as syphilodermia and polyadenia. In Prof. Martelli's opinion syphilis of the second generation, overlooked in the majority of cases, is much more frequent than is generally believed, and if medical men, who have the opportunity of practising for 50 years in small localities among a known population, know how to recognise it, probably even the heredity of the third generation would prove to be less rare, as his own cases show.

[1] La Pediatria, vol. xxxi., N. 6, 1923.

THE ROYAL SOCIETY CONVERSAZIONE.

AT the conversazione of the Royal Society held on May 16th there seemed to be fewer striking exhibits than usual, but there were several of particular interest to those engaged in scientific medicine. Recent advance in microscopic technique were illustrated by Mr. J. E. Barnard in a series of microscopes showing leptospira ictero-hæmorrhagica under different forms of dark-ground illumination. This method has hitherto been of limited value because of the small numerical aperture of the objective employed, but with this new apparatus it is possible to obtain the full value of a numerical aperture of 1·2 with a consequent great increase of resolving power. Dr. Leonard Hill and Dr. A. Eidinow demonstrated the effect of temperature on the biological action of light, showing that the lethal power of ultra-violet rays is manifested much more rapidly at 20° C. than at 10° C. Mr. H. Graham Cannon exhibited specimens of the decapitated water-beetle *Hydrophilus*, on which had been grafted the head of the water-beetle *Dysticus*. One specimen had been dissected to show that complete junction of the cut ends of the œsophagus had taken place. Dr. Hele-Shaw demonstrated the action of a new stream line filter in which fluid is forced between parallel sheets of impervious material which can be regulated at will to produce films of such a degree of attenuation that the matter in suspension can be prevented from entering the interstices between the sheets. From the National Institute of Industrial Psychology, through Dr. C. S. Myers, there came charts illustrating the higher output in coal-mines following improvement in illumination. Coal-miners are unanimous in their opinion that "frosted" lamps afford better vision and less eyestrain. Among other interesting exhibits were those shown by the Department of Zoology, British Museum, of specimens of deep-sea cables damaged by sharks who had fed on the animals growing on the outer casings. The specimens showed the teeth of sharks broken off and embedded in the cables. Another exhibit from the same department consisted of articles removed from the stomach of a man-eating crocodile; they were representative of several human beings, though the reptile's last meal was a porcupine. Mr. F. Harrison Glew's levitating magnet attracted considerable attention. It showed a bar magnet of cobalt steel floating by repulsion above the opposed poles of a fixed magnet. During the evening a demonstration was given by Sir Richard Paget of plasticine models, reproducing the English vowel sounds, and Mr. Walter Heape showed cinematograph films, taken at rates of from 2000 to 3000 per second, of the breaking of an electric bulb, and the behaviour of a rubber ball driven against a solid target.

STERILITY IN WOMEN.

THE question of the ætiology and treatment of sterility in women is one of importance not only to the individual, but also to any State. Certain inquiries recently carried out by gynæcologists in Germany are of more than local interest. Dr. Ludwig Nürnberger,[1] of Hamburg, has recently reported the results of these inquiries. Stress is laid on the importance of establishing a diagnosis of the condition responsible for the sterility before any treatment is

[1] Deutsche medizinische Wochenschrift, March 30th and April 16th.

commenced, as thereby much time and costly procedures may be saved, both to the patient and to the practitioner. In this respect it is most important to determine the patency of the Fallopian tubes. Excellent results have been reported in the last few years on the use of the passage of gas through the tubes to diagnose their patency. Rubin[2] reports 67 cases in which he introduced gas into the peritoneal cavity via the uterus and Fallopian tubes, thereby demonstrating that one at least of the tubes was patent. He observed no unfavourable results even in cases of chronic pelvic inflammation, but he does not advise this method in patients suffering from acute inflammatory processes. 250–300 c.cm. of oxygen are sufficient for the purpose, and with this quantity the disturbance to the patient is negligible, and she may continue her daily work after the examination; the discomfort produced by pneumo-peritoneum with larger quantities of gas is entirely avoided. The presence of gas in the peritoneal cavity is ascertained by radiographic examination. It has been shown by Seitz that during the premenstrual, menstrual, and postmenstrual periods, and after parturition the tubes are physiologically impermeable to gas, and therefore the examination must be carried out in the intermenstrual period. The results of these examinations reveal that mechanical obstruction in the tubes occurs much more frequently than was formerly supposed; Seitz and von Graff maintain that no woman ought to be operated on for sterility until the patency of the tubes has been established. Dr. Nürnberger has also used coloured fluid passed through the tubes under pressure from the uterus, and has observed the fluid emerging from the abdominal os during laparotomy. Apart from pure mechanical obstruction to conception, the part played by the internal secretions has of latter years been recognised, and the relation between adiposity and sterility has long been known. Kestner and Plaut[3] have distinguished, by means of estimations of metabolism, three forms of adiposity—namely, the pituitary, the thyroid, and the ovarian; further they have shown that the adiposity observed after atrophy of the ovaries or after castration resembles that of the pituitary form, and that therefore it is unlikely that there is a pure ovarian form.

Operative treatment is reviewed under four headings—viz.: (*a*) Dilatation of the cervix; (*b*) correction of faulty positions; (*c*) removal of fibroids, polypi, and repair of lacerations; and (*d*) renewal of the patency of the tubes. Although dilatation of the cervix is condemned by some on the ground that if the external os is large enough to transmit a red blood corpuscle (7·5 μ) during menstruation, it must also be large enough to allow of the passage of spermatozoa (2·3 μ), yet in practice it is well known that pregnancy in many cases follows rapidly on dilatation. In the reports received by Dr. Nürnberger there was some difference of opinion on the technique of the dilatation, some authorities advocating simple dilatation, while others combined this with incision of the cervix, and others again used incision only. Several maintained that preliminary dilatation with laminarial tents always led to catarrhal salpingitis. The figures of results given are various, and in many cases no figures are quoted, but Reifferscheid reported 17 cases with four successes after dilatation, and 28 cases with eight successes after dilatation combined with abrasion of the cervical mucous membrane. Kehrer had 22 successes out of 48 women treated with tent dilatation. Menge and Fehling emphasise the importance of simultaneously dilating the uterine cavity giving as the rationale for the procedure the view that cervical stenosis is often combined with infantilism of the body of the uterus, and that the mucous membrane is insufficiently developed for the embedding of the ovum. Prolonged packing of the cavity with gauze produces a high degree of hyperæmia, which leads to an increase in the development of the mucous membrane, thereby providing the necessary nidus for the process of embedding. Corrections of faulty positions of the uterus appear to play but little part in overcoming sterility, and are only undertaken in exceptional cases, for retroversion is either part of a developmental anomaly, or is the result of an inflammatory process, and in either case is not directly the cause of the sterility. Removal of fibroids and polypi and repairs of lacerations show excellent results in cases of sterility (arising in the latter case after parturition). The occlusion of the Fallopian tubes lies usually at the abdominal os, and is not only secondary to gonorrhœal and puerperal infection. It may also follow appendicitis, chronic constipation, and bleeding from a ruptured follicle. Two forms of occlusion can be distinguished—namely, simple closure of the os by adhesions, and closure by invagination of the fimbria, but whether the os is remade by freeing the adhesions or by making a new opening, there is always a danger that reformation of adhesions will occur, and the operative results are very disappointing.

The composition of the vaginal secretion has been much disputed in relation to its hyperacidity and consequent injurious effects on the spermatozoa, but the general consensus of opinion seems to be that alkaline douching has little effect, and that, in fact, as the spermatozoa are usually deposited close up to the cervix, the vaginal secretion can have but little effect on them. Organotherapy has proved useful in cases where the sterility can be traced to a deficiency of one of the internal secretions, of which the ovarian is but rarely at fault. The ovarian insufficiency is often secondary to one of another gland, such as the thyroid or the pituitary. Treatment by various baths is sometimes followed by good results, and massage, diathermy, pelvithermy, and X rays are advocated by some. On artificial fertilisation the questionnaire revealed nothing new. Adverse views are easily explained by the fact that there can be no certainty of bringing a living spermatozoön in touch with a living ovum in the upper genital passages. Practically the only condition in which the practice is permissible is in those cases of abnormality in the male when the spermatozoa are unable to reach the vagina. Dyspareunia may play a great psychical part in the prevention of conception and should be corrected wherever possible.

[2] Jour. Amer. Med. Assoc., September, 1911.
[3] Deut. Arch. f. Klin. Med., M. 139, p. 285.

THE ÆTIOLOGY OF DEFORMED JAWS.

SOME points in the ætiology of jaw deformities are discussed in an addendum by the assistant school medical officers and school dentists to the annual report for 1922 of Dr. J. T. C. Nash, county medical officer of health and school medical officer for Norfolk. The most common jaw deformities found in Norfolk are (1) narrowing and increase of height of the palatal arch, and (2) undue prominence of the incisor teeth; the former was generally associated with mouth-breathing due to nasal obstruction, and the latter with the use of too much soft food in infancy, and the habit of sucking thumbs, comforters, or "dummies." The most illuminating observations were those of Mr. P. Millican, school dentist. He found a large percentage of abnormal jaws in children living in damp and low-lying places, where the soil consisted of clay, marl, or other impervious beds. Such conditions led to catarrhs and nasal obstruction, mouth-breathing, usually aggravated by enlarged tonsils and adenoids, resulting in mal-development of the floor of the nose and roof of the mouth. Children born and living on high sites or on the sea front were more free from nasal obstruction and consequent narrowed palatal arches than those living in villages lying near the Broads and rivers. Mr. Millican explains that Norfolk is divided into two main sections of geological formation along a line drawn roughly from north to south of the county. On the west of this line is found the chalk; on the east is found a series of strata called the Norwich Crag. This formation is only interrupted by alluvial beds of clay and gravel deposited by various rivers. It

consists of alternate laminations of sands, clays, and pebbly gravels, and is therefore impervious or not always capable of good natural drainage. The chalk, on the other hand, is a pervious rock capable of good drainage. He has noticed a striking difference in the number of cases showing jaw deformity between the children living in the east and those on the west of this line, there being a higher percentage of abnormality on the east side. Thus it was found that the percentage of abnormal palates was under 10 per cent. in some parts and under 15 per cent. in all chalk districts, while it was over 20 per cent. in all the Norwich Crag districts where the soil was clay and under 20 per cent. in only one district where there was gravel. The Norwich Crag only outcrops in the western portion in one place, and covers about three square miles. Most of the children living in this section have abnormal palates. Dr. Nash concludes that Mr. Millican's observations justify placing the probable causes of jaw deformity in Norfolk in the following order of precedence: (1) Locality and environment; (2) habits, "comforters," and thumb-sucking; (3) ignorance or poverty or lack of common-sense on the part of parents; (4) heredity and congenital causes.

MEDICAL EDUCATION IN U.S.A.

WE are kept well informed of the state of medical education in the United States of America. In the *Journal of the American Medical Association* for April 28th were published, for the twentieth consecutive year, statistics based on official reports of examinations conducted by State medical boards, and of registrations by reciprocity and other methods. Increasing support and coöperation from the secretaries of State licensing boards has, during the 20 years, enabled those responsible to make these statistics accurate, reliable, and of great importance in relation to medical education and qualification. The number and qualifications of physicians admitted to examinations, the character of the colleges, the numbers registered and rejected, and the percentages are so arranged that the facts regarding any one college or State can be compared with those relating to other colleges or States. In some States there is evidently satisfactory protection of the public from practice by illiterate and incompetent physicians, whilst in others this protection fails in varying degrees. From the point of view of the prospective student, one table, showing the degree of recognition afforded to diplomas granted by certain medical colleges in States other than their own, is of especial importance. Sixty-one, or 75 per cent., of all medical colleges in the U.S.A. have complete recognition in all States. During the ten years in which this particular table has been published, the percentages of fully recognised colleges has risen from 29·0 to 75·3. Seven other colleges have now against them a few instances of non-recognition due to technicalities in State Medical Board requirements. The diplomas of the remaining 13 colleges are not recognised in from 9 to 47 States. It is evident that graduates of low standard medical colleges will flock to the States where less discrimination is exercised, and these States must remain as fields for inferior medical practice until they adopt more stringent regulations. All States except Colorado now require that applicants must have graduated from a medical school; all States require an examination of all applicants; 47 States have and are using authority to refuse recognition of low-grade medical colleges; 44 States have established reciprocal relations with other States; 10 States require a hospital internship as an essential for the licence, and all but two States—Arkansas and Connecticut—have abolished their separate boards of eclectic medical examiners or have limited their authority. In Connecticut, in 1922, the eclectic board licensed 79 physicians, 39 of whom graduated from low-grade medical colleges, and for 18 no data are found in the official files of medical colleges to show that they graduated anywhere. The eclectic board not only examined the graduates of eclectic schools, but evidently admitted all others who applied, the Connecticut law to the contrary notwithstanding. In Arkansas, out of 18 candidates licensed by the eclectic board, 17 were graduates of low-grade medical schools. Another problem is that of the licensing of osteopaths, who during the past six years have been admitted to examinations and licensed to practise by a few boards. The objection to this is not that these candidates are osteopaths, but that they are not required to present educational qualifications equal to those demanded of physicians. Inspection shows that osteopathic colleges lack properly equipped laboratories, expert instructors, and clinical facilities, and in the instruction the osteopathic idea is so emphasised that other valuable therapeutic measures are neglected. Despite these serious deficiencies in instruction, 74 osteopaths were licensed as physicians during the year under review. Another table shows that of the 29,338 physicians licensed during that period whose qualifications were obtained in classified colleges, 23,234, or 79·2 per cent., were from Class A medical schools, while only 4202, or 16·7 per cent. were from Class B schools, and 1902, or 4·1 per cent., were from Class C schools. The percentage of those rated in Class A colleges is increasing each year, while the percentages of those from Class B and Class C colleges are decreasing. To sum up: these statistics show for each medical school what improvements are essential if its graduates are to succeed in State board examinations, what State boards are requiring as a minimum of preliminary education, and in what States the boards refuse to examine its graduates. To each State board they show the qualifications of the physician licensed as compared with those licensed in other States, and the further improvements which are needed in its educational standards and methods of examination. Owing to political conditions and other factors, standards in certain States fluctuate considerably; but lessened confusion in licensing is general throughout the country, and continuous publicity has led to a general improvement and a greater uniformity in methods of examination.

[1] Butterworth and Co. 1923. 15s.

CASTRATION OR EPIDIDYMECTOMY FOR TUBERCULOSIS OF THE EPIDIDYMIS?

AT one time, and not very long ago, almost the only operative treatment for tuberculosis of the epididymis consisted of removing the whole testicle. There is much to be said for this operation, which enables the surgeon to avoid incising diseased tissues. But even unilateral castration is a mutilating operation and when, as not infrequently happens, the epididymis on the opposite side becomes involved, the surgeon who prefers castration to epididymectomy is likely to rob his patient of very important internal secretions. These and other considerations have led Dr. G. Söderlund[1] to compare the immediate and late results of the two operations, and his statistics deal with the period 1914–20, during which 52 patients were operated on for tuberculosis of the epididymis in a hospital in Gothenburg. In this period unilateral castration was performed in 37 cases and epididymectomy in 24, and in a certain number epididymectomy was first performed, being followed by castration at a later stage in the same case. Dr. Söderlund's preference for epididymectomy is shown by the fact that most of the castrations belonged to the earlier years of the period under review. Only in 20 per cent. of the castrations was the patient discharged from hospital with a fistula, whereas 50 per cent. of the patients on whom epididymectomy was performed still had fistulæ on discharge. This is eloquent proof of the disadvantages of dividing structures in the neighbourhood of, or involved by, tubercle bacilli. But the ultimate results were if anything in favour of epididymectomy. It was found that six

[1] Acta Chirurgica Scandinavica, 1923, vol. lv., fasc. v.–vi.

of the 37 patients who had undergone castration had died within three years of the operation, and six had developed tuberculosis in the epididymis on the opposite side. Of the patients undergoing epididymectomy, 20 were subsequently traced, and of the three who had died, one had died after epididymectomy followed by castration. Only in two cases had the testicle itself to be removed after epididymectomy because tuberculosis had invaded the testicle, and only in two cases were fistulæ found in the scrotal scar on re-examination. It is evident from this series of cases that when epididymectomy alone is performed, the chances of the testicle on the same side becoming tuberculous are comparatively small, so small, in fact, that Dr. Söderlund considers they should be ignored when choice is made between the two operations. His most convincing argument, however, on behalf of epididymectomy is that chronic inflammation of the epididymis is often not tuberculous. Yet such benign epididymitis may be clinically indistinguishable from tuberculous epididymitis. In as many as 13 cases in the period under review the diagnosis of tuberculous epididymitis proved, on microscopic examination after operation, to be mistaken. Doubtless, as Dr. Söderlund points out, several of these cases represented benign staphylococcal infections, and would have cleared up of themselves.

PRIMARY CARCINOMA OF THE URETHRA.

THE rarity of primary carcinoma of the urethra, of which Dr. Harry Culver and Dr. N. K. Foster,[1] of the Department of Cystoscopy, Skin, and Venereal Diseases of the Cook County Hospital, Chicago, have recently seen three examples, has induced them to record their observations with a review of the literature. The first case appears to have been reported by Bowin in 1833, since when the writers have collected a total of 120 cases. The incidence is highest in the female sex. The age-period between 40 and 60 appears to be the most susceptible in both sexes. In the female sex caruncle is undoubtedly an important ætiological factor, although mentioned in only about 10 per cent. of the reported cases. This is especially true of cases which have been frequently cauterised, chronic irritation playing an important part in the malignant degeneration of the tumours. In the male the predisposing causes are trauma, leukoplakia from chronic urethral irritation, and stricture formation, the latter occurring in about 50 per cent. According to Rizzi, the sites most frequently affected are the cavernous (52 per cent.), the bulbous urethra (25 per cent.), and the membranous and prostatic portions (22 per cent.). The onset is usually insidious, and it is not until the growth is well established that pain, disturbance of micturition, and hæmorrhage become prominent. The pain is usually not intense, but radiates into the thigh, pelvis, and vaginal fundus. There is sometimes dyspareunia, especially if ulceration is present. Urinary disturbances are constant, consisting in frequency of micturition, pain in the act, retention, and, finally, complete or partial incontinence. The general condition is not affected until the local process has become very advanced. Three forms of the disease may be encountered: the polypoid or papillary form, the ulcerative, and the infiltrative type. The diagnosis is made by the history, physical findings, and biopsy. In the male the condition must be differentiated from stricture, with extravasation or urinary fistula. The prognosis depends on the stage which the cancerous condition has reached when the patient is first seen and the associated morbid condition. In any event, it is serious, owing to the rapid course of the disease and the danger of recurrence. Treatment consists in operation or the application of physical agents, such as radium or mesothorium. The operative methods employed have been partial resection of the urethra, with suture of the urethral extremity to the mucosa of the vestibule or vulva, or total resection of the urethra, with the establishment of a neovaginal or suprapubic stoma. Extirpation of the involved inguinal glands has been attempted in ten cases. The use of radium and mesothorium is suitable for inoperable cases. The combination of operation with the use of radium has been effective in some instances. The writers' first case was in a woman, aged 65, who had suffered from pain and frequency of micturition for the last two or three years. Death occurred without operation, and the autopsy revealed primary carcinoma of the urethra, with extensive metastasis to the neck of the bladder and bilateral pyonephrosis. In the second case, which was in a woman, aged 35, the illness was of about seven months' duration, the first symptom being dyspareunia, followed two months later by vaginal protrusion, pain about the bladder, and frequent urination. An elongated, rounded mass was felt in the region of the urethra, extending back into the vagina. The patient was treated with radium, and two months from the last application the general condition was excellent, the pain had subsided, and the bladder was constantly emptied by a vesico-vaginal fistula which had been present for six weeks. The third patient was a man, aged 71, who had accidentally scalded his penis 11 months previously. Three months later he observed a hard growth on the under surface of the organ, and within the last fortnight he had had difficulty and pain on micturition. A diagnosis of primary carcinoma of the urethra was made and confirmed by histological examination after radical amputation of the penis. When the patient was seen six months later there was no sign of recurrence.

[1] Surgery, Gynecology and Obstetrics, April, 1923.

ULCUS EPIDEMICUM.

IN a paper read before the Beirut University Pathology Society, Dr. Walter Book Adams,[1] professor of dermatology in the American University of Beirut, remarks that the terms tropical endemic or epidemic ulcers have been used loosely and vaguely for a variety of diseases, such as tuberculosis cutis, syphilis, framboesia, or oriental button. In the present paper he describes under the name of ulcus epidemicum an epidemic of ulcers which invaded Syria, a subtropical country, during the war. His attention was first drawn to the ulcers in 1916 on the legs of men suffering from starvation œdema, where the sores resembled hospital gangrene in their rapid, shallow, phagedænic growth, the foul odour of the pus, and the difficulty in getting them to heal. In 1917 there were more cases, but fewer of the phagedænic type, examples being found in abundance along the coast from Gaza to Alexandretta. In 1919 the outbreak was prevalent among the poor in inland cities such as Jerusalem, Nazareth, Damascus, Homs, Hamath, and Aleppo. In 1920 there was a marked diminution in the cases, and by 1922 only occasional ones were seen. The ulcers usually appeared in the late spring after the rains had ceased, being essentially a dry-weather disease, and never beginning in the rainy season. They were almost invariably found on exposed parts of the body, the principal sites in order of frequency being the legs, ankles, feet, hands, and forearms. The knees and elbows were rarely affected. The ulcers were usually simple, but occasionally they were grouped. The lesion began as a small itching papule, which rapidly increased in size and became very painful. In one or two days it broke down forming a raw angry ulcer with a sloughing surface, discharging a thick brownish fœtid pus. If untreated the lesion became a chronic ulcer, lasting for years with increasingly hard sclerotic edges. Bacteriological examination showed a symbiosis of a fusiform bacillus and a spirillum as in Vincent's angina, associated with numerous cocci. Treatment consisted in stimulating the tissue to a healthy reaction and granulation, and protecting it from further invasion of cocci, flies, and dirt.

[1] Archives of Dermatology and Syphilology, May, 1923.

QUINIDINE IN AURICULAR FIBRILLATION.

EXPERIENCE is steadily accumulating as to the value of quinidine sulphate in the treatment of auricular fibrillation. Great claims often accompany the introduction of a new remedy which later proves not to meet them, but the specific action of quinidine on the auricle can be demonstrated by graphic records. The dangers of its use were magnified in earlier reports partly because it was then used in more than sufficient doses, and partly because it was tried in unsuitable cases. That it is a valuable adjunct in the treatment of heart disease is becoming steadily apparent, and the observations of Dr. J. G. Emanuel in this issue of THE LANCET add to its position. It is not claimed by cardiologists that quinidine will approach the almost universal application of digitalis in cardiac therapeutics, and we should like to emphasise the fact that digitalis holds exactly as high a place in the treatment of heart failure as ever it did, its employment having become more carefully selective. Indeed, quinidine has no direct value in heart failure, and most of the untoward results are attributable to its use when failure is present. The function of quinidine is to restore the normal regular rhythm to a heart showing auricular fibrillation, and to that extent, and to that extent only, to improve cardiac efficiency. The attempt should be made when failure is in abeyance or when failure has been allayed by digitalis. In a word, digitalis combats heart failure, and quinidine abolishes auricular fibrillation which disposes to failure. Safety is attained if suitable cases are chosen and a moderate daily dose is reached by steps so that an idiosyncrasy towards the drug would be promptly recognised. So guided the danger is slight, but successful results will depend largely upon the care and skill with which the action of the drug upon rhythm is followed day by day during the course of treatment.

METHODS OF SLAUGHTER.

WHERE animals are killed periodically in an enclosed building there would always appear to be an apprehension of death by them. Fortunately the terror can never be so great as that of the human being who is destined to be hanged on the morrow. If fear before slaughter is to be reduced, in the case of animals, to a minimum, the sight, sound, and as much as possible, the smell of death should be hidden from the victims' senses. In other words, each animal should be separately and individually slaughtered. The slaughtering in batches and in sight of each other of pigs and sheep has always appeared to us callous and barbarous. The Jewish method of slaughter, which consists in severing the blood-vessels of the neck with a sharp knife, seems to be quite humane. It has the advantage that the animal is effectively controlled before the method of despatch is brought into operation. Providing the control is carried out humanely, as it invariably is, this mode of killing would appear quite merciful. In Pamphlet No. 2, on the Jewish Method of Slaughtering Animals, published by the Board of Deputies of British Jews, the quoted opinions of 285 veterinary surgeons coincide in declaring that the Jewish method of slaughter is devoid of cruelty. It is true that the majority of these opinions are from German sources, but they are those of practical men of good standing. Most experts agree that the animal becomes unconscious within three seconds after the throat is cut, and the real matter at issue seems to be whether the pain produced by a severe blow that smashes the cranial bones and penetrates the brain is more or less than that produced by a sharp knife making a deep incision. Meanwhile only the introduction of a practicable way of anæsthetising animals before slaughter, non-injurious to the flesh as human food, would satisfy everyone.

THE Croonian Lectures on the Rôle of Fats in Vital Phenomena will be delivered on June 7th, 12th, 14th, and 19th, at 5 P.M., at the Royal College of Physicians of London, Pall Mall East, by Prof. J. B. Leathes.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

XXI.

THE TREATMENT OF ANTE-PARTUM HÆMORRHAGE.

THE first duty when faced with a case of ante-partum hæmorrhage, whether it be slight or severe, is to try to make out whether or not the placenta is attached to the lower uterine segment, since the management of the case after the first hæmorrhage will proceed upon different lines according to the position of the placenta. The determination of this point may be very easy or very difficult. If there have been labour pains and the internal os is open, a partially detached portion of placenta may be felt on passing the finger into the uterus, and this will settle the matter. But if the patient has had no labour pains and is a primigravida, the cervix will be closed and the problem then has to be approached in a different way. No assistance can be obtained from the mode or time of onset of the bleeding, the period of pregnancy, or the character and extent of the first attack of hæmorrhage. Examination of the urine may, however, give valuable help. The differential diagnosis cannot be disposed of in a word and at the first examination the diagnosis must often remain in doubt, but in general terms it may be said that if the head presents and is readily recognised per vaginam, and if the urine contains albumin, the case is almost certainly one of accidental hæmorrhage. If, however, the breech lies below and vaginal examination yields little information, and the urine is normal, the case is probably one of placenta prævia.

Common to both conditions is the need of what we may call for simplicity "hospital treatment"; except in patients of the luxury classes, immediate removal to hospital or nursing home is essential.

Treatment of Hæmorrhage Before Labour.

The immediate treatment of hæmorrhage which is not accompanied by labour constitutes a fairly simple problem. In most cases the first hæmorrhage is moderate in amount and the patient should be put to bed, given morphia (gr. ½ to ¼), and detailed obstetric examination should be deferred until the bleeding has ceased. A catheter specimen should be examined and an effort to establish the differential diagnosis should be made.

Accidental Hæmorrhage.—Let us suppose a seven months pregnancy, with head presentation, some albuminuria, and slight œdema of the feet. It is a case of accidental hæmorrhage, the essential factor of which is probably a mild toxæmia. With careful prophylaxis there is an excellent chance that the bleeding will not recur. The patient should be kept in bed and careful eliminative treatment carried out. The diet should contain little protein; diuresis should be produced by drinking large quantities of water, and the bowels should be caused to act loosely twice a day by saline purgatives. The urine should be examined daily, the patient being kept in bed for a week after the bleeding has ceased. Even if no further hæmorrhage occurs special care is required for the remainder of pregnancy, the important points being to secure free action of all channels of elimination and to watch for albuminuria. The prognosis is good. If despite prophylactic treatment, or in cases where this has not been carried out, recurrence of the hæmorrhage occurs without labour, the same treatment should be applied, and the patient kept under close observation for a longer time. Her general condition will probably deteriorate with each attack of bleeding, for apart from the results of loss of blood, there is the toxæmic factor to be considered.

The rare but very grave condition of concealed accidental hæmorrhage probably would never be seen

at all if prophylactic treatment were carried out in all cases after the first attack of bleeding.

Placenta Prævia.—The management of cases of placenta prævia can be sharply distinguished from the above. (1) No prophylactic treatment is practicable, for the bleeding results from a condition entirely out of our control; (2) recurrence of the hæmorrhage is inevitable, and each recurrence tends to be more serious than the preceding one. It follows that we cannot afford to temporise as we may do in a case of accidental hæmorrhage. As a rule it is inadvisable to wait for the recurrence of the hæmorrhage.

Two courses are open in a case of placenta prævia when labour has not begun: one is to induce labour, and the other is to perform Cæsarean section. Cæsarean section is indicated if the patient is a primipara, if the child is alive and of at least 36 weeks' development, and the placenta can be felt all round the margin of the internal os (central placenta prævia). Any one of these conditions taken alone constitutes an arguable case for the Cæsarean operation, but the presence of all three should leave no doubt in our minds whatever. On the other hand, induction should be practised if the patient is a multipara, if the child is dead or non-viable, and if only one side of the os is occupied by the placenta. Again, any one of these conditions taken alone may be held to constitute an indication for induction in preference to Cæsarean section.

The principle underlying these indications is that induction is to be preferred (1) when the local conditions are such as to favour easy delivery (e.g., parity), (2) when the amount of hæmorrhage is not likely to be extreme (e.g., in lateral placenta prævia), and (3) when the child is dead or its survival is already jeopardised by a high degree of prematurity. When the converse conditions are present Cæsarean section allows of rapid delivery, with less hæmorrhage, and a fair chance of survival of the child.

Method of Induction in Placenta Prævia.—Before induction external podalic version may be required, since a breech presentation allows readier control of hæmorrhage during labour than a vertex. For a primigravida with closed cervix the intra-uterine bougie method, performed with strict antiseptic precautions and under anæsthesia, is probably the best. If, however, the patient is a multipara, and the internal os admits the tip of the index finger the decision is not so easy. If the membranes can be felt they should be ruptured with the finger or with forceps. If they cannot be reached and the placenta appears to cover the os completely, it is best to tear through the placenta, perforate the membranes, and pull down a foot into the vagina. This is practicable with one finger only, but is much easier if the cervix will admit two fingers. Traction can then be made in the manner to be described below.

The Conduct of Labour with Ante-partum Hæmorrhage.

Since in most cases the labour is premature, the child's chances of survival are small, and preservation of the mother's life becomes the first consideration. Cæsarean section may be done early in labour when the indications for it detailed above are all present. Generally speaking, however, accidental hæmorrhage is best treated by rupture of the membranes followed by evacuation of a considerable quantity of liquor amnii; placenta prævia is best treated by pulling down the half breech into the cervix after preliminary podalic version if required. In cases of central, or approximately central, placenta prævia rupture of the membranes is not to be recommended, since bleeding is likely to be too severe to be controlled by the pressure of the advancing head. After tearing through placenta and membranes, and pulling a foot down into the vagina, gentle and continuous traction is applied, and labour always proceeds briskly; moreover, the half breech plugs the lower uterine segment and completely controls hæmorrhage. A weight of 2 lb. may be attached to the foot, but the mother must then be left to deliver herself. Even if the cervix is sufficiently dilated to allow of instant delivery, the temptation to effect this should be resisted, for it is essential that the uterus should have regained its contractility when the moment comes for the delivery of the child. Full use of any interval should be made in the application of restorative measures; in serious cases infusion of blood is the best, but should no donor be available gum saline solution can be used. When the uterus is acting well and the presenting part has passed through the pelvic brim, 0·5 c.cm. pituitrin may be given.

An alternative procedure to podalic version is the use of de Ribes's bag, but in my opinion this is only suitable for cases in hospital when expert aid is always instantly available, and then only under limited indications.

Plugging the Vagina.

Plugging the vagina I regard as a useful emergency measure: (*a*) As a preliminary to removal of the patient to hospital in an urgent case; (*b*) in either variety of ante-partum hæmorrhage, to check bleeding while other methods are in preparation. Further, in many cases of accidental hæmorrhage, plugging the vagina combined with previous rupture of the membranes is the method of choice, and no other interference may be required. Further, in cases of concealed accidental hæmorrhage, vaginal plugging combined with active restorative measures, will often give the patient her only chance of recovery.

The technique of vaginal plugging demands a word. Unless it is thoroughly done the bleeding will continue unchecked, and unless the strictest precautions are observed sepsis will follow. The packing must be so carried out that the upper part of the vaginal canal is tightly distended and the cervix completely surrounded by the packing material; a vaginal speculum, a long pair of forceps, and a good light are required, and in primiparæ an anæsthetic. When the vaginal vault has been filled, the packing should be pushed upwards with the finger and moulded tightly round the cervix. Unless done in this way it is a waste of time to pack the vagina for hæmorrhage. The vulva should first be shaved and disinfected with iodine or violet green, and the vaginal walls also disinfected. The best material for packing is sterilised "bismuth gauze"—i.e., gauze impregnated with subgallate of bismuth; this can be obtained in 12-yd. lengths of 2 in. wide, and the end of the first length used is tied to the next so as to make a continuous pack. It is expensive but can be relied upon to show no sign of putrefactive changes for 24 hours. A useful domestic substitute is made from long strips of sheeting or tablecloth, cut to appropriate width, and *boiled for an hour before use.* Packing should always be removed in 24 hours if delivery has not taken place, and some other method of controlling hæmorrhage must then be adopted if necessary. A large proportion of cases in which vaginal packing is adopted in hospital practice show a febrile puerperium, and there is no doubt that the risks of infection which are associated with it are difficult to obviate.

Summary.

1. Prophylactic treatment after the first attack of bleeding is strongly advised in accidental hæmorrhage, but is inadmissible in placenta prævia.

2. Certain cases of placenta prævia are best treated by Cæsarean section after the first hæmorrhage.

3. Cases of placenta prævia in labour are as a rule best treated by podalic version and pulling down a leg.

4. Dilatation of the cervix by de Ribes's bag is not recommended.

5. Most cases of accidental hæmorrhage and certain mild cases of placenta prævia are best treated by rupture of the membranes.

6. Plugging the vagina after rupture of the membranes is useful in many cases of accidental hæmorrhage.

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Special Articles.

THE CONSTANTINOPLE BOARD OF HEALTH.

A BRIEF HISTORICAL SURVEY.

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PART I.

AMONG the innumerable minor effects of the late war must be counted the disappearance of the Constantinople Board of Health—a body which for over three-quarters of a century had directed the Turkish maritime sanitary administration, and had, under the International Sanitary Conventions, been charged with the task of safeguarding Europe from the importation of disease from the East. An institution that, for so long a period, had endeavoured to carry out so responsible a task, may well merit an obituary notice, and the present moment seems an opportune one for giving some account of its origin and history. For, while the Board ceased to exist effectively as an international body after the autumn of 1914, its abolition has not even yet been formally admitted or recognised by the Powers other than Turkey. The question of the future organisation, destined to some extent to take its place, was discussed at length in the first Peace Conference at Lausanne, with results that are still under consideration and cannot, therefore, for the present be made public; but, when the time shall come for their being made known, a right understanding of the problems involved will only be possible if based on a knowledge of their past history. The present survey makes no pretence to be a complete picture of the Board's work—a much larger canvas would be required for any such attempt; it can only lay claim to be a greatly condensed account of the origin of an important sanitary institution and of the methods by which it endeavoured to carry out its international mandate.

The Origin of the Board.

Some obscurity attaches to the birth of the Board, but a study of contemporary original documents has made it possible to piece together the following sketch of its origin and its later developments. The year 1839 has sometimes been given as the date of the Board's coming into existence, but some form of mixed Sanitary Council was unquestionably sitting in Constantinople in 1838. The still earlier attempts of the Turkish authorities to establish a system of quarantine on their frontiers may be rapidly passed over. It is claimed by the Turks that, on the occasion of the great cholera epidemic of 1819, some form of quarantine was applied to ships arriving in the Bosphorus; and that in 1836 a Turkish Quarantine Board, composed of three members, was already in existence. Then, in 1837, mention is found of a Turkish proposal to establish quarantines in the Dardanelles and, in December of the same year, of a further proposal to modify the then existing quarantine laws in Crete. Objections were raised in various quarters—including the Committee of the Privy Council for Trade—to the imposition of quarantines in the Dardenelles except under the strongest necessity.

In April, 1838, the Sublime Porte addressed a circular Note to the heads of missions in Constantinople, formally announcing the intention of the Sultan (Mahmoud II.) to set up a system of quarantines in his empire. Couched in the somewhat flowery language common to proclamations of eastern potentates in those days, the Note stated that His Majesty the Sultan, wishing to calm the fears that "the contagion" (i.e., of the plague), then manifesting itself from time to time in Constantinople, must inspire in the public, had ordained that the system of quarantines should be adopted in his realms. The mode of applying such quarantines, it was added, was then being considered, and the nature of the sanitary measures decided on was to be indicated in a later communication. On May 19th, 1838, the *Moniteur Ottoman*, the official gazette of the time, published a long article, setting forth in great detail the philosophical and religious reasons for opposing rational measures, such as quarantines, to the calamities with which it has pleased the Almighty to afflict mankind. The article is too long to quote, but it is a document of no little human interest. On May 22nd the Turkish Minister for Foreign Affairs addressed, as promised, a second communication on this subject to the representatives of the Powers. In this the decision to establish quarantines was reaffirmed; the necessity of protecting from contagion, and "if necessary disinfecting" the city of Constantinople was emphasised; cordons and lazarets were, it was stated, to be established; infected places and effects were to be disinfected; cases of plague were to be notified; no dead body was to be buried, no matter what the cause of death, without being inspected by the authorities and a permit given, and so forth. The authority charged with carrying out these measures was spoken of as the "Direction de la Quarantaine," and this appears to have been the earliest public health authority brought into existence in Turkey.

Earliest Regulations of the "Conseil Supérieur de Santé."

On endeavouring, however, to obtain consent to these proposed measures, it at once became evident that their application would be contrary to the Capitulations—under which Turkish officials were unable to visit the domiciles or board the ships of foreign nationals unless accompanied by a consular representative of the country concerned; and this was clearly pointed out in the replies of the Powers to the Turkish Note. In July or August, 1838, some form of Sanitary Council or Health Board was actually sitting, and a British dragoman (Mr. Charles Wood) and others were assisting at its meetings. The council was already spoken of as the "Conseil de Santé," or Board of Health; a little later it became the "Conseil Supérieur de Santé"—and this title it continued to bear throughout the rest of its existence. A draft "règlement" was drawn up by this body in the autumn of 1838, and was considered by representatives of the foreign missions in November. In this document a quarantine of 20 days was demanded even for empty ships; a bill of health was required not only for a ship but for every person on board the ship; a tribunal was proposed for judging cases of infraction of the rules. Ships' manifests, as well as their bills of health, were required to be submitted for examination by the quarantine officials. So strict was the quarantine demanded that it was even proposed to give to the sanitary guards at the lazarets the right to fire on any person attempting to escape. Sanitary offices were to be established at Kavak, near the northern end of the Bosphorus (where a lazaret was actually built later and still exists), and at Gallipoli in the Dardanelles. A temporary lazaret was to be created at Kouléli in the Dardanelles, and certain charges were to be levied on ships until a regular tariff should be drawn up and accepted by the Powers. On land, health officers were to be empowered to enter houses where plague cases existed or were suspected to exist, and to take the necessary measures, if authorised to do so by some member of the Board of Health.

Objections were raised to most of the proposals, more especially to the long quarantines and to the right of sanitary guards to fire on any one attempting to evade them; and it is not clear how many, if any, of the draft measures were actually applied during this period of negotiation—a period which lasted for a considerable time. In the summer of 1839 a fresh effort was made by the Turkish Government to obtain acceptance of its proposals—to which had now been added one to the effect that that Government should

be authorised to adopt and put into execution the sanitary measures, but that these measures should first be suggested by the foreign delegates to the Board. A "Règlement Organique pour les provenances de mer" was drawn up, and signed on June 10th, 1839. The preamble to this Règlement is of sufficient interest to be quoted in full; it is as follows:—

"Les soussignés composant, d'une part, le Conseil de Santé sous la présidence de S.E. Hifzy Moustapha Pacha, de l'autre la délégation étrangère accréditée par les différentes missions, à la demande de la Sublime Porte, près ledit Conseil, s'étant réunis en conférence à l'effet de délibérer sur le choix de système quarantenaire le mieux approprié à cette Capitale contre les provenances de la mer, animés d'un égal désir de concilier, autant que possible, les garanties sanitaires avec les besoins de commerce maritime, ont, après mure délibération, arrêté de commun accord les résolutions suivantes: (Then follows the text of the regulations)."

From this it is clear that the presence of foreign delegates on the Constantinople Board of Health was brought about *at the request of the Turkish Government itself*. The regulations contained 19 articles, and one "additional article." It is interesting to note the resemblance of the problems that had then to be faced to those with which sanitarians in the Near East are still confronted. Ships were then, however, as for many decades after, dealt with according to their bills of health and not to the actual state of the ship. Bills of health were either "clean" (*net*), "suspect," or "foul" (*brut*); the corresponding flags to be hoisted were white, black and white, and black. A bill of health was "clean" if delivered 30 or more days after the last case of plague in the port of departure, and such ships received immediate pratique. A "suspect" bill of health was one delivered between 15 and 30 days after the last case; such ships had to do 15 days of quarantine if loaded and 10 if empty. A "foul" bill was one delivered less than 15 days after the last plague case, and for such ships a quarantine of 20 days, if loaded, was required, and 15 days if empty. Ships of the last two categories were required to take on sanitary guards at the Dardanelles or at Gallipoli, if passing up the Straits, and at Kavak if passing down; and only empty ships were allowed to pass the Straits and proceed "en quarantaine." The maximum quarantine for goods was 20 days. Infractions of the regulations were to be judged by the laws in force in European countries, and the offender was to be handed over to his own authorities for punishment. A sanitary tariff was annexed to the regulations, setting forth in detail the taxes to be charged for bills of health and for the "interrogatoire"; the quarantine dues on ships, on persons and on animals; and the charges for disinfection of goods. Ships of war were exempted from all sanitary charges.

This document, it is of interest to note, bore the following signatures: A. Pezzoni, Ed. de Cadalvène, Ant. de Raab, F. Bosgiovich, J. Bosgiovich (delegates); Hifzy Moustapha Pacha (president); Drs. Minas, MacCarthy, Neuner, Bernard, Marchand, and G. Franceschi (members of the Board). It will be observed that not only the delegates but also the members of the Board were, with the exception of the president, of other than Turkish nationality, and for a very considerable period Turkey herself provided no medical member of the Board. About this same period the question of overland quarantines was discussed and regulations were drawn up; but the death of Sultan Mahmoud II., on July 1st, 1839, seems to have led not only to this question being dropped, but also, apparently, to a considerable diminution in the activities of the Board of Health and the quarantine authorities.

The minutes (*procès verbaux*) of the Board—destined in the course of three-quarters of a century to fill some hundreds of large volumes—begin only with the meeting held on Feb. 10th, 1840. The minutes of that meeting fill but half a page of a folio volume. It was not until the "35th meeting," held on August 28th, 1840, that any signatures were attached to the minutes, and it is of interest to note that among the signatures of those present at that meeting (held 83 years ago) occurs that of Dr. E. D. Dickson, who appears to have been at first intermittently and later permanently the British delegate to the Board until his death in 1900—the year in which I had the honour to succeed him in that capacity and as physician to H.M. Embassy.

The Powers represented on the Board in 1840 were apparently the five Great Powers, Sardinia, and Greece. For the first few years the Board contended against many difficulties and much opposition on the part of the Turkish Government. The latter seems to have regretted having created the institution and to have made considerable efforts to reduce its powers to a nullity or even to break it up altogether. In 1844 the president is said to have attempted to exclude the foreign delegates entirely and to make what remained of the Board "dependent upon his arbitrary pleasure." On the initiative of the British Ambassador, Sir Stratford Canning, the heads of missions in Constantinople made strong representations to the Turkish Government as to its unsatisfactory attitude towards the institution and, as a result, the arbitrary proceedings of the president were checked, and it was agreed that all questions—whether they related to the appointment of medical or other officials or to the administration of the quarantine department—were to be decided by a majority of votes in the Board of Health. Further, a Turkish official in the confidence of the Porte and properly qualified for the task was appointed to take part in the discussion with the delegates and the other European members of the Board.

Such, briefly, was the origin of the composite body which was destined to direct sanitary affairs on the coasts and frontiers of the Turkish Empire for a period of some 75 years—until, indeed, the outbreak of the Great War in 1914. Space will not permit of a detailed account of its history throughout that long period. It passed through many vicissitudes, and at one critical moment of its history, when its action met with the disapproval of the reigning Sultan, the latter threatened to swamp it by the nomination of a large number of Turkish members, sufficient to outvote the foreign element on the Board—a threat analogous to that made a few years ago to a more august body in this country. Throughout the later decades of its existence the Board was composed of eight Turkish members and a varying number of foreign delegates, reflecting the political changes in Europe during that period. At the moment of its extinction in October, 1914, the foreign delegates numbered 13, representing the following Powers: Austro-Hungary, Belgium, France, Germany, Great Britain, Greece, Holland, Italy, Persia, Russia, Spain, Sweden, and the United States of America. Norwegian interests were entrusted to the German delegate.

On May 27th, 1840, a second and more extended "Réglement Organique" was adopted, prescribing the sanitary measures to be enforced, but no similar code defining the composition, attributes, and powers of the Board was ever drawn up. These were, however, gradually more or less clearly defined by means of another international body, of which more will be said later—the Mixed Commission for Revision of the Ottoman Sanitary Tariff. The tariff annexed to the 1840 "Réglement" remained in force until it also was modified by the Commission just named.

Extension of the Work of the Board.

It will be seen, from what has been said above, that the Constantinople Board of Health was originally a local body, brought into existence to meet the immediate menace of a plague epidemic and limiting its aims mainly, if not entirely, to the protection of the Turkish capital. It only later extended its work to the protection of the other ports and frontiers of the Turkish Empire and gradually assumed the many other responsibilities that fell to it during the later decades of its existence. Though it had, as has been shown, a semi-international character from its very

beginning—as regards its composition at least—it was not until some 13 years after its creation that it received any definite international mandate from the Powers in general. But it received that mandate from the earliest moment that the Powers came together in a sanitary conference, and were thus in a position to make any joint utterance on international sanitary matters; and the mandate was confirmed and enlarged by the subsequent Conferences and Conventions. Thus the first International Sanitary Conference, that of Paris, 1851, specifically charged the Board with the execution of sanitary measures in the Turkish Empire, and authorised it to fix the places where such measures would be applied; to publish regulations, based on the Convention; to appoint and dismiss its personnel, and so forth. It required that the foreign delegates on the Board should be appointed by their respective Governments, and should be "as far as possible specialists." Similar clauses appeared in the (abortive) Paris Convention of 1859. The third Conference, that of Constantinople, 1866, while mainly dealing with cholera from the scientific point of view, incidentally discussed the financial affairs of the Board, as will be shown later. The Vienna Conference of 1874 scarcely mentioned the Board; that of Washington of 1881 was concerned only with yellow fever; the Rome Conference of 1885 was not followed by a Convention; and those of Venice, 1892, and Dresden, 1893, did not deal with the Board's affairs. But the Convention of Paris, 1894 (as also the three later Conventions), prescribed that all pilgrim ships entering or leaving the Red Sea should comply with a "special ordinance applicable to the pilgrimage to the Hedjaz," to be published annually by the Constantinople Board of Health in accordance with the principles laid down in the Conventions, and this practice was followed by the Board. It further required that the supervision of these measures should be entrusted to a committee, chosen from the Board and to consist of three Turkish members, and of representatives of Powers that had acceded or should accede to the Conventions of 1892, 1893, and 1894. This latter clause was not strictly adhered to; it was, however, the practice of the Board to elect each year a Pilgrimage Committee, composed of one or more Turkish members and of delegates representing the Powers most interested in the Mecca pilgrimage. That committee revised each year the "special ordinance" and endeavoured (rarely, it must be admitted, with complete success) to make it conform in every detail with the pilgrimage clauses of the later Conventions.

The Venice Conference of 1897 was concerned with the serious danger to Europe arising from the outbreak of plague in India and more especially with measures applicable to pilgrim ships. The Convention that followed contained detailed recommendations for the reorganisation of the great lazaret of Camaran (Turkish) and of those of Abou-Saad (Turkish) and El Tor (Egyptian). In this Convention measures were for the first time prescribed for the sanitary protection of the Persian Gulf, and the Constantinople Board was charged with their execution, and with the reorganisation of the sanitary defences of the Turco-Russian and Turco-Persian frontiers. The Paris Convention of 1903, while again confirming the general mandate of the Constantinople Board, contained important clauses prescribing the composition and attributions of the Board, the reduction of the Turkish members from eight to four, and so forth. Unfortunately most of these clauses were not accepted by Turkey, and therefore remained inoperative; they were completely eliminated from the last Convention, that of Paris, 1912. The Conventions of 1894, 1897, and 1903, however, confirmed the financial arrangements of the Board, which are referred to in more detail below.

But there were other duties, not specifically mentioned in the Conventions, which the Constantinople Board was called upon to discharge. It had the sanitary supervision, not only of the great pilgrimage to the Hedjaz, but also of the Shiah pilgrimage and carriage of dead bodies to Kerbela, Nejef, and the other Shiah holy cities in and near Mesopotamia. Further, although the Board's mandate was in principle limited to the coastal and frontier defences of the Turkish Empire—the interior sanitary defences being in the hands of the Turkish authorities—a special exception was made in the case of the Hedjaz Railway (connecting Damascus with Medina), and for some years before the war the sanitary defences of that line had been provisionally entrusted to the Board until some more permanent arrangement should be come to.

It will be seen, then, that the Board's responsibilities were by no means light. Its mandate covered an immense geographical area—extending from the Turco-Persian and Turco-Russian frontiers on the east to the Albanian coasts of the Adriatic on the west; from the Black Sea coasts of Asia Minor on the north to the shores of Tripoli in Africa and the Arabian coasts of the Red Sea on the south; and including such varied conditions of population, climate, race, and religion as are (or were) to be found in Arabia, Mesopotamia, Asia Minor, Armenia, Syria, Palestine, Crete and the Ægean Islands, Tripoli and the Cyrenaic peninsula, Thrace, Macedonia, and Albania; while in former years it embraced such additional trifles as the territories that have since become the independent states of Bulgaria, Roumania, and Serbia.

(To be concluded.)

PARIS.

(FROM OUR OWN CORRESPONDENT.)

The Suppression of Abortion.

THE Chamber of Deputies has adopted a Bill modifying the provisions of Article 317 of the Code Pénal with reference to abortion. Henceforward, whoever, by the administration of certain foods or medicaments, or by manipulation, violence, or any other means, shall have procured or attempted to procure abortion in a pregnant woman, with or without her consent, will be liable to imprisonment for from one to five years, and to a fine of from Fr.500 to Fr.10,000. A woman who has procured abortion on herself, or who has consented to use the methods indicated to her for this purpose, with the result that abortion takes place, will be liable to imprisonment for a period of from six months to two years, and to a fine of Fr.100 to Fr.2000. Doctors, health officers, midwives, surgeon-dentists, pharmacists, as well as medical students or employees in chemists' shops, herbalists, and sellers of surgical instruments, who have indicated, recommended, or practised these methods, will be condemned to the penalties set out above. Those found guilty may, besides, be temporarily suspended or permanently prohibited from practising their profession, according to Articles 25 and 26 of the law of Nov. 30th, 1892, which articles in this connexion are applicable to qualified pharmacists and herbalists, as well as to those aspiring to diplomas. Besides the penalties mentioned, the courts may forbid the person found guilty from residing in a stated neighbourhood for a period of from two to ten years.

It is, unfortunately, to be feared that even the maximum penalty of 10,000 francs and five years' imprisonment will still be insufficient to prevent the crime of abortion. Recently a girl, Inda Kriginold, and her lover, Benjamin Kotlar, both Russian subjects and students of medicine, were arrested; they had an excellently equipped consulting room, most comfortably furnished and fitted with all necessary apparatus for preserving the strictest asepsis. They had been practising for many years, and were responsible for over 1000 abortions. In view of the danger to the future of the country, it may be hoped that heavy punishment will be meted out to criminals of this type.

Scottish Medical Students in Paris.

The Scottish medical students at present in Paris were recently received by the Association Générale

des Etudiants, who are now housed in the old Faculty of Medicine. A soirée was organised in honour of the visitors, and was presided over by Mr. Roger, the Dean of the Faculty of Medicine. The day before a trip to Versailles was organised, to which both French and Scottish students were invited, and proved an excellent means of promoting friendliness among the two batches of students.

Neurological International Reunion.

The fourth annual Neurological International Reunion will be held on June 8th and 9th, in the amphitheatre of the Ecole des Infirmières, at the Salpétrière. The sessions will take place in the mornings from 9 to 12, and in the afternoons from 3 to 6. The main subject discussed will be medullary compression. Those reading papers include Sir James Purves Stewart and Dr. George Riddoch, of London, on the Pathological Anatomy and the Pathogenesis; and Mr. Ch. Foix, of Paris, on the Physiology, Clinical Pathology, and Therapeutics.

Pasteur Centenary.

The programme of the fêtes arranged to celebrate the Pasteur centenary are as follows. Foreign delegates will be received at the Elysée on May 24th. In the morning of May 25th a visit will be paid to the Institut Pasteur and the tomb of Pasteur. In the afternoon a ceremony will be held at the Sorbonne, under the presidency of Mr. Millerand. On May 26th a visit will be paid to the Ecole Normale, and in the afternoon a reception will be held at the Hôtel de Ville. On Sunday, May 27th, various societies will receive the delegates, and in the evening gala nights at the Opéra and the Théatre Français have been arranged. On May 28th a banquet will be held at Versailles, and on the 29th a garden party will be organised at Chantilly by the Institut de France. On May 30th the delegates will repair to Strassburg. On May 31st the monument to Pasteur will be unveiled, and after a banquet lunch the Pasteur Museum and the hygiene exhibition will be opened. In the evening a reception will be held at the Hôtel de Ville.

The Medical Service of Paris at Night.

Visitors to Paris would do well to acquaint themselves with an organisation for medical emergencies at night provided by the police authorities for strangers, persons without a regular medical attendant, and others. This organisation has existed for some time, and a recent inquiry into its working by *L'Echo de Paris* has proved it to be run in a very satisfactory manner. This is the more creditable as the difficulties in making the machinery work smoothly were at first considerable. "Le Service Médical de Nuit" is available for everyone, and when the family doctor is out of town, or the patient does not wish to disturb him and is anxious to avoid delay, application is made in person or by telephone to the nearest police station. A telephone message is sent from the station to headquarters, where one or more of the staff of 30 doctors are on duty from 10 in the evening till 6 in the morning. The doctor proceeds at once in a motor with emergency appliances to the address given him, and it is seldom that the interval between sending for the doctor and his arrival is more than 20 minutes. If he desires to write a prescription, this is taken to the police station, whence a cyclist takes it to a chemist and brings back whatever has been prescribed to the patient's house. The charge for such a night visit is fixed at Fr.20, but this fee may be reduced if, on inquiry, circumstances warrant such a reduction, and in case of extreme poverty the fee is waived altogether. At first this night service was limited to doctors under the age of 30, but there is now no age limit, and the doctors on the staff take duty in rotation. The average number of calls per night is 30 to 35, and it is evident that this system is a boon not only to patients, but to doctors who, having had a long day's work, have richly deserved an uninterrupted night's rest.

May 17th.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

The Midwives Act.

THE law recently passed concerning the training and practice of midwifery provides that, apart from the medical profession, only trained midwives are entitled to deal with parturition and childbed. Their training will extend over 18 months, and must be practical as well as theoretical; it will be carried out at one of the public midwifery schools which exist in every province. During her training a candidate must attend at least 50 parturitions; admission to a training school is made dependent on a certificate of health and good conduct, and a person applying for admission must be at least 20 and not more than 30 years of age. After practical training a candidate must pass a theoretical examination in the physiology and pathology of pregnancy, parturition, and childbed, and in the care of newborn children. The practical training includes the diagnosis of abnormal cases; if the latter are not available at the time of examination the candidate must prove her knowledge on an anatomical model. A midwife being qualified after examination may not live where she likes, as has hitherto been the case; the law provides for distribution of midwives according to the wants of the population. In places where they refuse to settle the Government may eventually appoint district midwives at a fixed salary. The law provides for a scale of fees graded according to the wealth of the mother, the minimum fee being payable by poor persons and club patients. A minimum income is guaranteed to midwives, and when fees paid by patients do not reach that minimum the balance is to be covered by the Government. The midwife must summon a medical man in every abnormal case, and if the mother and her family refuse she must decline all responsibility, ask for a certificate stating that she wishes a medical man to be summoned, and report the refusal to the district medical officer. Cases of puerperal fever must be notified at once to the district medical officer, and for the duration of that case, and for some time afterwards, the midwife must abstain from work with other mothers under constraint of heavy penalties. Each midwife must keep a register, which will be checked by the district medical officer, who is empowered to examine the midwife's knowledge every second year. The midwife must attend a three weeks' post-graduate course every five years in a provincial training school; if she fails to do so without a reasonable cause her qualification may be withdrawn. The qualification may also be withdrawn for grave misdemeanour and unprofessional conduct. The law provides for the institution of district midwifery boards—to consist of two midwives, two mothers, and female representatives of the sick clubs, under the chairmanship of the district medical officer—and also of provincial midwifery boards. Rather curiously, the law defines the term "mother" as "a woman having borne at least one living child." The most important alterations brought about by the new law are the creation of a definitely professional body of midwives, and the granting of a minimum income.

Proposed Settlement of German Medical Men in Afghanistan.

The Afghan Government has invited German medical men to settle in that country, offering a salary of £15–25 a month, to be reduced to half in cases of illness. The Afghan authorities declared that a medical man only requires £5–6 to keep him, and that he would thus be able to save the rest of his salary. In the *Aerztliche Mitteilungen*, the official organ of the German Medical Union (Leipziger-Verband), a correspondent states, however, that the minimum expenses necessary for a professional man in Afghanistan range from £15 to £25 a month, so that a medical man earning the sum offered would be unable to save. The correspondent compares

the salary offered with that granted to officers of our Indian Medical Service.

Cocainism in Germany.

The abuse of cocaine has greatly increased since the war. Formerly it occurred almost exclusively among persons having easy access to the drug, such as druggists, workers in chemical factories, and sometimes medical men. In a recent discussion at the Berlin Medical Society it was stated that the cocaine habit has now invaded nearly every class of the population, and to a greater extent than the morphia habit. Cocaine is snuffed, and is thus easier to take than morphia, which requires injection; it also produces more agreeable sensations. The habit has been further spread by the numerous Russian emigrants now settled in Berlin. Cocaine may not be sold without a written prescription from a medical man or dentist, but it is sold clandestinely, especially by waiters and attendants in certain restaurants patronised by the demi-monde. Great masses of cocaine were stolen after the war, during the revolutionary period, from the Government stock kept for the use of the military hospitals. The production of cocaine is now only allowed in certain factories under Government control (where it is not manufactured from raw cocaine, which may be misused, but extracted by a very complicated chemical process from coca leaves brought from Java), and import of the drug from abroad is strictly licensed. It was argued in the discussion at the Berlin Medical Society that these measures were not sufficient to suppress the evil; that people, especially those living in large towns, wanted stimulants, and that coffee, tea, tobacco, and beer were very expensive compared with cocaine, of which only a small quantity was necessary to produce intoxication. Thus, when the prices of other stimulants were lowered, the abuse of cocaine would be greatly reduced. It was, however, also stated that the majority of persons indulging in cocaine do not do so for reasons of economy, but that they are for the greater part psychopathic subjects unable to face the difficulties of the present hard times without a drug.

Public Health in Prussia.

The Prussian Minister of Health in a recent report to the Prussian Parliament on the state of public health in Prussia stated that diseases of the bronchi and lungs have greatly increased as a result of the scarcity of fuel. Tuberculosis, which showed a constant decrease before the war, has again increased enormously, the number of deaths recorded being 56,000 in 1913, 110,000 in 1918, 78,000 in 1920, and 83,000 in 1921. Since 1918 12 per cent. of hospitals, 15 per cent. of infants' homes, and 15 per cent. of public dispensaries have had to be closed for want of means; the supply of food to hospital and other patients has become inadequate, and other hygienic measures have had to be abandoned. The attention of the Government was especially drawn to the state of health of the children; the general underfeeding of the children which resulted on the blockade can never be made good, and although when the blockade was lifted an improvement occurred, especially with the help of the Quakers, the cost of food is now again productive of distress. In many schools, according to the reports of school medical officers, 50 per cent. of children are underfed, and in some Berlin schools 20 per cent. of the children have had to be temporarily exempted from attendance on account of anæmia and general weakness. Those coming to school have often had no breakfast. The deficiency of linen and soap, and the expense of baths, make proper care of the body very difficult, and diseases of the skin are frequent. Many schoolchildren have no shirts, or are compelled to wear the same shirt for months. Deaths due largely to hunger have been reported in several districts—230 cases in one district alone. Scurvy, before the war almost unknown in this country, occurred in 36 cases, of which 10 were fatal.

May 12th.

CONGRESS OF THE ROYAL INSTITUTE OF PUBLIC HEALTH.

IT is perhaps a sign of the widening view of what constitutes public health that the President of the Congress, Lord Riddell, at the inaugural meeting in the Grand Hall of the Spa at Scarborough chose for the theme of his address the problem of capital and labour. He gave an impartial survey of the changes during the last 25 years. Labour, which was then concerned with wages, hours, and conditions, now claimed to take a part in the management of industry and the reconstruction of the State. "The group mind," said Lord Riddell, "gives no indication of becoming more altruistic. It behoves every man and woman to take an interest in a question of such vital importance to the future of the country."

The business of the Congress began on May 17th in five sections.

Section of State Medicine.—At the meeting of this section Sir William Middlebrook, M.P., traced the development of municipal work, which, he believed, had not yet reached its full height of activity. Mrs. Edwin Gray (York) spoke of the place of the voluntary worker in public health, and stated that suspicion and jealousy were gradually disappearing with the practice of working in water-tight departments. Dr. J. R. Kaye (M.O.H., West Riding) introduced the housing question. He gave some deplorable examples of overcrowding, and estimated that at least 45,000 houses were needed at once in the West Riding alone.

Women and the Public Health Section.—Lady Dorothy Wood, in her presidential address, stressed the need for creating an enlightened public opinion. Dr. Jane Walker (East Anglian Sanatorium) dealt with the prevention of consumption, and expressed the opinion that although food, milk, and housing were important, tuberculosis was largely an industrial disease. Dr. H. Scurfield, in agreeing, hoped in future more prominence would be given to the sex death-rates in industrial towns, as this would bring out more clearly the effect of occupation in causing consumption. At the afternoon session the milk problem was dealt with by Mr. Wilfred Buckley, Dr. Eric Pritchard, and Dr. Scurfield. The trend of the papers was that the extension of the movement for "tubercle free" milk would only be slow, and that in the meantime pasteurised milk and good brands of dried milk were safe substitutes, little, if any, inferior in food value, which had certainly played a part in the recent remarkable decline in infant mortality.

Industrial Hygiene Section.—Sir Lynden Macassey presided over this section, and welcomed the fact that employers were beginning to cöoperate with the Industrial Fatigue Board, and were inviting the active assistance on a business basis of the National Institute of Industrial Psychology. Sir Thomas Oliver gave an address on the Health of the Worker a National Asset, dwelling on the extraordinary variations in the percentage of fitness among the workers of different districts revealed by the recruiting statistics. There was great need for an improvement, not only in housing conditions, but also in the ventilation, &c., of factories. He further advocated a better and more uniform system of recording sickness in our large factories and of standardising the records.

Other Activities.—Lieut.-General Sir Arthur Sloggett presided over the Naval and Military, &c., Section, and Dr. Frederick W. Twort over the Section of Bacteriology and Biochemistry. In a popular lecture Dr. C. W. Saleeby urged the claims of sunlight, and said our industrial cities showed the most appalling contrasts in respect of light-starvation with the cities of Germany, Switzerland, Canada, and the United States. The thing to do in the interests of childhood was to restore the sunlight to our towns, which were the blackest on earth.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following table gives some of the principal statistics for 1922 of four towns varying considerably in position, population, and types of inhabitants.

Name of district.	Estimated population (mid-year).	Birth-rate.	Death-rates per 1000 of population.				Death-rates per 1000 births.		
			All causes.	Tuberculosis.	Cancer.	Respiratory with influenza.	Infant mortality		Maternal mort. in childbirth.
							Legit.	Illegit.	
Bootle C.B. ..	79,750	25·7	13·7	1·6	0·8	3·6	75	234	3·4
Edmonton U.D. .	68,700	22·1	10·8	1·0	1·2	2·2	67	125	3·3
Stoke Newington M.B.	52,620	17·8	12·9	0·9	1·2	3·5	—	—	5·3
Margate B. ..	27,820	17·0	11·6	0·9	1·6	1·9	59	29	4·2

C.B., County Borough. M.B., Metropolitan Borough. B., Borough. U.D., Urban district. Where a short line is given the figure is not available from the report.

Bootle.

Dr. F. T. H. Wood reports a sharp outbreak of influenza from mid-January to mid-March with a particularly heavy incidence among young children. The elementary schools were closed from Feb. 1st to 10th and steps were taken under the Bootle Corporation Act to close Sunday schools and to exclude children from cinema halls and places of entertainment. A new pavilion of 28 beds for advanced cases of tuberculosis at the Linacre Hospital was opened in May. The Corporation maintain six beds at Leasowe Hospital for Children suffering from non-pulmonary tuberculosis, but provision is needed for adult cases, who need surgical treatment. The municipal maternity home was opened in February. Sixty-nine patients were admitted. The regular charge is six guineas for a fortnight. The actual charge averaged £4 2*s.* per patient. The cost to the rates, after deducting contributions and grant, for the year ending March 31st, 1923, was £571. Public health educational work is being undertaken in earnest and a successful "Health Week" was held in October. The municipal housing scheme has now come to an end with the completion of 302 houses. Originally two sites were purchased and it was intended to erect 314 houses on site 2 and 280 on site 1. Now part of site 1 has been allotted to the educational authority for a school and site 2, under instructions from the Ministry of Health, has been offered for sale. Dr. Wood says there is some diminution of the more serious overcrowding by the completion of 200 houses during the year, but he points out that the excess of births over deaths during this period was 958.

Edmonton.

Dr. H. W. Harding reports that diphtheria continued to be prevalent for the first quarter of the year and that chronic nasal carriers gave trouble. Three of these carriers had their tonsils enucleated and one was benefited by a diphtheria vaccine. The Schick test has not been used, but Dr. Harding is a believer in swabbing, and the routine practice of swabbing diphtheria contacts is adopted. The ante-natal clinic has become very popular. A cleansing station, including bathrooms, a shower spray for dirty heads, and electric fan for driving warm air for drying the hair, a formalin chamber for leather goods, &c., was added to the equipment of the school medical department during the autumn. All cases of tonsils and adenoids are freed from oral sepsis by dental treatment before operation. Operations are performed at the North Middlesex Hospital. A fee of 10*s.* is charged and 5*s.* extra if the case is kept for the night on medical grounds. After operation the cases are conveyed home in the Council's ambulance with a nurse in attendance. The value of the dental scheme has been increased during the year by the appointment of a dental anæsthetist who holds both dental and medical qualifications. Dr. Harding would like to see more differentiation between the backward and the mentally defective children for educational purposes. "It does seem curious," he says, "that a sum of £50 per year can be spent on a mental defective who at the age of 16 is turned adrift to follow his own resources and that no special provision is made for the dull child, who, by his natural intelligence, will probably make good in later life." Dr. Harding reports that the housing problem is still a serious one in Edmonton.

Stoke Newington.

Dr. H. R. Kenwood gives some advice as to cancer, emphasising the need for avoiding sources of prolonged irritation. The "danger signals" of cancer are clearly set forth and the fact that lives could be saved if people would attend to these danger signals and seek early medical advice. At the end of the year Dr. Kenwood investigated the home circumstances of 40 "open" cases of pulmonary tuberculosis. Twelve of them occupied bedrooms shared by from one to three children under 12 years of age. He would like to see provision for the removal either of the cases or of the children, and thinks that resident institutions for such children would be one of the wisest provisions that could be made for checking the onslaughts of this disease. A dental clinic is badly wanted in connexion with maternity and child welfare work. A notable feature of the southern portion of the borough is the "tenementation" within recent years of houses originally built for and occupied by one family. Industrial development of Stoke Newington is unlikely to occur, but there is an urgent need of more dwellings to reduce the excessive occupation of many existing ones.

Margate.

Dr. Rowan McCombe reports that ten cases of enteric fever were notified and that half the patients had eaten freely of cockles. He says that these shell-fish are supposed to be treated by steam for a sufficient time to kill any harmful bacteria before being sold to the public, but since this process tends to destroy the flavour and harden the fish sterilisation is often skimped or neglected. The meteorological report shows a great contrast to that of last year. The hours of sunshine were 1562, compared with 1800, and the rainfall was 20·5 inches, compared with 9·28 inches.

SCHOOL MEDICAL SERVICE.

Hull.

THE school medical officers in Hull paid 1189 visits to schools and examined 20,513 children, including 5399 special cases. The number requiring treatment or special observation was 5793. The vision and hearing of 5672 children between the ages of 6 and 7 years were estimated by means of test types and the whisper test—the latter a test extremely difficult to carry out in an ordinary school with any degree of accuracy, and the result is not recorded. The vision test of these children discovered 5·6 per cent. with defective vision—that is, with vision of less than 6/12, this figure being the same for boys and girls. Dr. J. W. Fraser states, "the vision of boys improves from code group to code group, the cases of defective vision being only 4·1 per cent. at 8 to 9 years, and 3·8 per cent. at 12 years; among girls there is a slight deterioration, the cases of defective vision being 6·7 per cent. at the 8–9 year period and 6·5 per cent. at 12 years." One cannot question the accuracy of these deductions as the numbers dealt with are not supplied, but it must be remembered that in testing the vision of the younger children with the ordinary Snellens test type there is a considerable mental factor which cannot be ignored.

Unfortunately an outbreak of diphtheria of such severity as to make it necessary to close the school obtained for five weeks. Out of 788 swabs 158 gave positive results and 16 developed clinical diphtheria. An especially interesting feature of this report is the section devoted to special schools. Great care has been taken to find out the after-results of the special care taken of these children. In the last ten years 34 persons (18 male and 16 female) left Osborne-street special school for deaf children. These have been followed up, and the result given (Table I.).

TABLE I.—*Number Employed; Earnings per Week.*

	Boys.				Girls.			
—	Unpaid.	Less than 20s.	20s. to 40s.	More than 40s.	Unpaid.	Less than 20s.	20s. to 40s.	More than 40s.
(a)	—	5	5	2	—	—	4	—
(b)	—	—	—	—	—	—	—	—
(c)	1	—	—	—	4	2	—	—
(d)	—	—	1	—	—	—	—	—
(e)	—	1	—	—	—	—	—	—

(a) Industrial or manual occupations. (b) Agricultural and rural occupations. (c) Domestic occupations. (d) Commercial or clerical occupations. (e) Precarious work.

Two—one of each sex—are incapable of employment on account of deafness, 1 girl has died, 1 girl has left the city, 3 girls are now married, 1 boy has been employed and is now out of work, and 1 boy is in another institution.

The after-careers of persons discharged from the special school for mental defectives are naturally different. Of 166 children who have left the Malton-street special school for mentally defective children since 1912, 12 have died, 27 are incapable of employment on account of mental defect, 32 are in residential institutions for mentally defective persons, 10 are in other institutions, and 16 have left the city or cannot be traced. Table II. shows the earning capacity of those employed.

TABLE II.—*Number Employed; Earnings per Week.*

	Boys.				Girls.			
—	Unpaid.	Less than 20s.	20s. to 40s.	More than 40s.	Unpaid.	Less than 20s.	20s. to 40s.	More than 40s.
(a)	—	11	7	1	—	2	3	—
(b)	—	2	1	—	—	—	—	—
(c)	3	—	—	—	18	1	—	—
(d)	—	—	—	—	—	—	—	—
(e)	—	19	—	—	—	1	—	—

(a) to (e) as Table I.

Dr. Fraser points out that if a similar number of mentally defective persons all over the county are given residential treatment, the number of institutions required and the expense incurred will be very large; but against this, he says, must be set off that, in a well-managed institution, each inmate does something towards his support and any chance of children being born to inherit the parental defect is prevented.

As Park-avenue special school for crippled children was opened as recently as 1920, it is impossible to get out corresponding returns for the cripples, but substantial progress in school work and medical treatment is reported. The school has 69 children on the roll, 41 of whom are here as a result of infantile paralysis, and there are 12 cases of tuberculous disease. The superintendent spent a month at the Cripples' Hospital at Alton during the year with excellent results, and the children are now making their own splints. Forty cases have massage and 35 electrical treatment daily. The children are happy, and their health throughout the year has been good.

Leeds.

The school medical officer here is assisted by seven full-time doctors, three part-time specialists, and a whole-time nursing staff of 26 nurses. There are in the city 290 schools and departments, including elementary, secondary, special and trade schools, and 269 of these reported cases of scarlet fever during the year, 2110 cases being notified. Scarlet fever followed on the heels of a widespread epidemic of measles. In one school—Blenheim-street—a case of measles was reported in the infant school on May 1st. The first crop of cases occurred from May 8th until the 15th; the infected class was closed on May 29th, when the epidemic had run its course and the second crop was falling "in the hope that other cases already infected would develop the disease out of school." This hope was promptly realised; the epidemic became thoroughly out of hand and continued throughout the year, 120 schools and departments being closed. Dr. Algernon Weir is inclined to the view that want of sunlight and the low summer temperature were the predisposing causes. At routine inspections 25,673 children were seen. Of these 2884 were found suffering from malnutrition, 10,304 from defective vision, 5706 from nose and throat affections, 308 from defective speech, and 1689 children were under special observation for subnormal nutrition. 5678 children were referred for treatment. A new system has been adopted whereby treatment is paid for by parents according to their means, whereas formerly treatment at clinics was free. During the year 38,154 children received treatment, including 15,073 dental and 14,226 minor ailment cases.

The Services.

ROYAL ARMY MEDICAL CORPS.

Maj. J. E. Powell retires on ret. pay and is granted the rank of Lt.-Col.

MILITIA.

Capt. I. M. Pirrie relinquishes his commn. and retains the rank of Capt.

TERRITORIAL ARMY.

Capt. V C. de Boinville relinquishes his commn. and retains the rank of Capt.

Capt. J. Eason, having attained the age limit, is retired and is granted the rank of Maj.

Capt. H. Platt relinquishes his commn. and retains the rank of Capt.

DEATHS IN THE SERVICES.

Lt.-Col. James Currie Robertson, I.M.S., C.M.G., C.I.E., C.B.E., who died from heart failure following pneumonia on May 13th, graduated in medicine and surgery at Glasgow University in 1894, and two years later received his first commission in the Indian Medical Service. In 1897 he was placed on plague duty, and in 1901, having already reached the rank of Captain, he was appointed Deputy Sanitary Commissioner to the Government of India. He was later deputed to South Africa for the purpose of organising concentration camps, and became Sanitary Commissioner in India in 1912, five years before reaching the rank of Major. For service in the Soudan he was decorated with medals in 1896, and for service in South Africa the medal with clasp in 1902.

UNIVERSITY OF ABERDEEN: STUDENTS' HOSPITAL GALA WEEK.—As the result of the Gala Week (April 23rd to 28th) held by students, the local hospitals will benefit to the extent of £4753. This was the fourth gala week organised by the students. In 1920 the aggregate sum received without deducting expenses was £1560, in 1921 £2230, in 1922 £4266 and this year £4971. From the official financial statement issued by the Gala Week Committee of the S.R.C. some idea of the various forms of appeal and the success met with may be gathered.

Jazz band performances, £523; collections in outlying districts, £887; sports day, £107; rectorial dance, £201; football match, £245; house to house collection, £501; dramatic performance, £304; beach day, £216; street day, including torchlight, £1453.

The money was allocated as follows: Royal Infirmary, £3000; Sick Children's Hospital, £1000; Maternity Hospital, £500; Morningfield Hospital, £100; Eye Institution, £100; Aberdeen District Nursing Association, £53.

Correspondence.

"Audi alteram partem."

PSYCHO-PATHOLOGY IN THE CURRICULUM.

To the Editor of THE LANCET.

SIR,—I am interested in your excellent leading article in THE LANCET of last week and in the "suggested schedule of training for the general practitioner" proposed by Sir George Newman. This schedule corresponds very closely to the teaching that has actually been provided for the last three years in the Psychiatric Department of Edinburgh University, which is as follows:—

1. There is a course of 20 lectures on "Psychology for Medical Students," given by the distinguished reader in psychology, Dr. James Drever. This course is optional but it is well attended.
2. Eight tutorial lectures are delivered on psycho-pathology, psycho-therapy, psycho-analysis, and mental tests by the two university assistants in psychiatry. Specialists such as Dr. W. H. Bryce, of Kenlaw House, and Dr. Murray Lyon (hypnotism) have also assisted.
3. Twenty systematic lectures and cliniques on mental diseases are given by the professor of psychiatry. Dr. Clarkson, of the National Institution for the Training of Imbeciles (which the students visit), lectures on mental defect.
4. The Royal Infirmary, Edinburgh, has wards containing 24 beds for early and mild cases of mental disorder, and Dr. J. D. Comrie, the physician in charge, gives weekly cliniques. These are supplementary to the courses I have mentioned.

It will be noticed on comparing this teaching with Sir George Newman's suggested schedule that it exceeds his proposals very considerably, but nevertheless no difficulty is experienced in getting the students to attend as the subjects are very attractive to them after their prolonged studies in things material. In particular the time devoted to "Psychology for Medical Students" is from two to four times longer—20 lectures are given as compared with the 5 to 10 recommended by Sir George Newman. The Medico-Psychological Association (Section of Psychology and Neurology) have both petitioned all the licensing bodies and the General Medical Council to introduce compulsory attendance on psychology into the medical curriculum. I am chairman of a committee of the British Association (Section of Psychology), also appointed to consider this question and to report. In so wide and important a subject I think 20 lectures is a minimum.

I am, Sir, yours faithfully,

GEORGE M. ROBERTSON.

University of Edinburgh, May 21st, 1923.

THE ANATOMY OF THE PITUITARY REGION.

To the Editor of THE LANCET.

SIR,—From your annotation on the Bowman lecture (THE LANCET, May 5th, p. 912) it seems that Dr. George de Schweinitz, after paying a tribute to the memory of Sir William Bowman, detailed the results of his researches in conjunction with Dr. J. Parsons Schaeffer, professor of anatomy in the Jefferson Medical College, Philadelphia, into the anatomy of the pituitary region. "In 125 bodies examined," said Dr. Schweinitz, "it was found that the optic chiasma was in direct relation to the chiasmatic sulcus in only five (or 4 per cent.), although this was the position universally assigned to it in anatomical text-books." So far as I know, it may be true, even at the present day, that all anatomical text-books do make the statement ascribed to them, but I think it right to point out that the idea expressed by the two workers mentioned above is not new.

In the Proceedings of the Anatomical Society for May, 1894, Mr. T. W. P. Lawrence wrote: "In some recently observed specimens the commonly accepted position of the commissure upon the optic groove was departed from; and although the number of cases examined was too small to justify the statement that the commissure never lies upon the optic groove he believed that such will be found to be the case." I myself had noted but not published the fact so far back as 1891, but in a communication to the *Journal of Anatomy and Physiology*, vol. xxx., entitled "Origin and Intra-cranial Course of the Ophthalmic Artery," I took the opportunity of drawing attention to the point in question and of confirming Mr. Lawrence's published observations. For many years I have abandoned in my lectures the use of the term sulcus chiasmaticus or optic groove and called that groove the olivary groove, which is merely a topographical name, and in the same lectures I have emphasised the fact that the groove is the result of the meeting of the anterior root of each orbito-sphenoid during the growth of the skull. The under free edge of each is sufficiently thick to produce a bar-like structure, the jugum sphenoidale, on the olivary eminence behind which there is a sort of groove which has been assumed to lodge the chiasma.

I am, Sir, yours faithfully,

EDWARD FAWCETT,
Professor of Anatomy, University of Bristol.

May 16th, 1923.

SERUM DOSAGE IN DIPHTHERIA.

To the Editor of THE LANCET.

SIR,—I am extremely sorry if I have in any way misquoted Dr. Frederic Thomson. I understood that his intervention in this discussion was primarily intended to support the dose recommended by the Ministry of Health for doubtful and suspicious cases, a dose which I had ventured to criticise as unnecessarily large for the purpose. I should have doubtless been more accurate had I used the words "as advised by the Ministry" instead of "as advised by Dr. Thomson," but I considered that Dr. Thomson was, so to speak, acting as champion of the Ministry's memorandum. All I meant to imply was that, where particularly severe forms of diphtheria are concerned, the dose "advised by the Ministry" was as little likely to be effective as the dose advised by myself, that both in all probability were directed merely against the average case and not specially virulent types. As regards the question of safety and efficiency I certainly felt that the Ministry's dose would not be harmful to the patient, and it must be remembered that some practitioners still seem to believe there may be risk in giving a large dose, and that it would be effective in securing, what I take it was the Ministry's object, a notable reduction in diphtheria mortality. I never intended to suggest that it would save every case. Dr. B. A. Peters has already assured us, and Dr. Thomson in his last letter agrees, that doses of 10,000 or 15,000 units, even if given on the first day, do not hold up cases of the type now prevalent in Bristol, so it is quite clear that 8000 units would be as useless as 3000 units, if given as a precautionary dose, while waiting for the result of the swab. It seems to me that those who suggest that the medical officer of health should advise practitioners when a severe type is prevalent and recommend a larger dose for the time being are quite right, and that it is not reasonable that the whole country should give unnecessarily large doses because, for instance, a severe type may be prevalent in the East-End of London.

I have not, to the best of my recollection, had a case of this type admitted to hospital on the first day; indeed, from the very nature of it it seems improbable that such an early diagnosis is likely except in a hospital official. I have not, therefore, had the opportunity of trying 60,000 units on the first day. Quite possibly, as it is impossible to compare cases, the types may be different, but in my experience 50,000 or 60,000 units given later seem to have very little effect.—I am, Sir, yours faithfully,

CLAUDE B. KER, M.D.

City Hospital, Edinburgh, May 12th, 1923.

TUBERCULOSIS OF THE SACRO-ILIAC JOINT.

To the Editor of THE LANCET.

SIR,—Through the kindness of a friend of mine I have now received copies of the actual tables in Dr. Rollier's "Heliotherapy," which were quoted by your correspondent Mr. P. B. Roth in his letter of May 5th, under this title, and which, he says, "for the sake of brevity I have combined in one table." If these tables which follow be compared with Mr. Roth's it will be seen that in his desire to be brief he has misquoted the headings and thus vitiated the evidence of the figures.

1903–1913.

Tuberculosis of the pelvic bones (and sacro-iliac disease).	Total	Healed.	Improved.	Stationary.	Died.
Without abscess ..	6	6	—	—	—
With abscess ..	10	10	—	—	—
With sinuses ..	21	9	1	6	5*a*
Total	37	25	1	6	5

a = Arrived with amyloid degeneration.

1913–1921.

Tuberculosis of pelvic bones (sacro-iliac disease).	Total	Healed.	Improved.	Stationary.	Died.
— ..	24	20	3	—	1*a*
With sinuses ..	22	12	8	2	—
Total	46	32	11	2	1

a = Renal tuberculosis.

There is a vast difference between tuberculosis of the pelvic bones as a whole and tuberculosis of the sacro-iliac joint.

I am, Sir, yours faithfully,

Liverpool, May 19th, 1923. H. C. W. NUTTALL.

THE MANAGEMENT OF PERITONITIS.

To the Editor of THE LANCET.

SIR,—In your leading article in THE LANCET of May 19th, referring to the Hunterian oration by Mr. H. W. Carson, it is stated that "irrigation of the cavity when the inflammatory process is diffuse is given up by nearly all surgeons. It is impossible to remove the infective material by this means; on the contrary, irrigation forces this material into unattacked regions, prolongs the operation, and damages the peritoneal membrane." I agree that irrigation of the abdomen in the presence of diffuse infection is a wrong procedure, and has very properly been given up by nearly every surgeon at the present day. The chances of the patient's recovery in such cases are greatly diminished by free irrigation. The modern procedure which is generally adopted of mopping out quickly the excess of fluid from the pouch of Douglas, introducing a large drainage-tube to the bottom of the pouch, keeping the patient in the Fowler position, supplying fluid either per rectum or, in more desperate cases, subcutaneously, getting the bowels to act by aperients as soon as possible, and washing out the stomach if necessary is attended by most excellent results. When, as was generally done 15 or 20 years ago, the abdomen was freely flushed or irrigated with saline few cases recovered. The reason for this is, I think, quite obvious. It was impossible, as you say in your article, thoroughly to remove all infection, but I do not agree that conveying infection to other parts of the abdomen (when, as is frequently the case, the whole abdominal cavity is infected) can do much harm, especially if the Fowler position is adopted afterwards; neither is it reasonable to suppose that any damage to the peritoneum would result from replacing stinking pus by normal saline. The length of time occupied by the process is a more serious objection. But the real objection is this.

During the development of a spreading general peritonitis, following, for example, the perforation of an appendix or a gastric or duodenal ulcer, there is an acute inflammatory condition of the serous membrane set up by the irritation of the highly toxic material in the abdominal cavity; this is accompanied by a free exudation of serum and migration of leucocytes into the cavity and the development of pus, all the flow is *from* the vessels *into* the abdominal cavity, and comparatively little of the toxic material is absorbed into the blood. If this were not so cases of general peritonitis would be far more rapidly fatal But when the abdomen, containing a considerable quantity of septic pus, is freely irrigated with a fluid such as normal saline, a certain quantity of fluid is always left behind; this fluid, which is highly toxic, is rapidly absorbed into the circulation. It is well known that large quantities of normal saline, when introduced into the abdominal cavity, are very rapidly absorbed; the current is reversed; instead of being *from the blood stream into the peritoneal cavity, it is from the cavity into the blood stream*, and the patient dies of toxæmia.

This I believe to be the true reason why lavage of the abdomen in cases of general infection is such a useless and dangerous procedure, and why it should be emphatically condemned.

I am, Sir, yours faithfully,

HERBERT H. BROWN, O.B.E., M.D., F.R.C.S.

Ipswich, May 18th, 1923.

PROPHYLACTIC URETHRITIS.

To the Editor of THE LANCET.

SIR,—I was much interested in the annotation on prophylactic urethritis in your issue of Jan. 27th. In 1919 I was running a hospital in Scutari (Shkodra), Northern Albania, and an N.C.O. attended for acute urethritis. Repeated microscopic examinations failed to detect anything but pus cells. Afterwards I found that he had been using the calomel cream thrice daily since his indiscretion ten days before. Perhaps cases described by Drs. Bonnier and Rivoalen were also due to excessive use of the preventive. That the army issue is a preventive, if properly used, I have no doubt. I remember once in Egypt, on the first anniversary of the armistice, when the local disinfectant offices were for some reason closed, I found a very harassed orderly corporal in the hospital tent who said that during the night he had treated 60 men of the battalion. Not one of them developed venereal disease, though all had been exposed to infection. The only failure I had was a man who used the preventive six weeks after the event!

I am, Sir, yours faithfully,

L. FRASER, D.M.O.
(Late Captain, R.A.M.C.)

Famagusta, Cyprus, April 28th, 1923.

THE ORAL ADMINISTRATION OF PANCREATIC EXTRACT.

To the Editor of THE LANCET.

SIR,—A statement authorised by the Medical Research Council that preparations of the pancreas recommended for administration by the mouth have not the action of insulin, is rather hard to accept as final. It is true that there are many extracts of the gland for oral administration on the market which are without value, but have any of these been proved to act upon glucose in vitro? I am, however, glad to be able to report a substantial alteration in the urinary analysis of a patient—a girl of 9 years—who has had diabetes for five years and who has been under modified "Allen" treatment for over three years; this alteration I can only ascribe to the taking of the gland by the mouth. The extract was

supplied to me by Dr. R. L. Mackenzie Wallis, whose article upon its preparation appeared in THE LANCET on April 14th. For two and a half years the reappearance of sugar, from any cause, in the urine of this patient was invariably accompanied by the presence of diacetic acid. As a result of four weeks' treatment with Dr. Wallis's preparation this hitherto constant association has been abolished, and the diacetic acid is to-day only brought back by a considerable addition of fat to the diet. Otherwise, the child may pass sugar in the urine but no diacetic acid.

From a practical point of view this change is of the utmost importance in general practice, for whereas 14 months ago the onset simultaneously of glycosuria and acetonuria was so sudden that a semi-comatose condition was established by a dietetic error within 48 hours of the urine having been sugar-free; to-day the reappearance of the sugar—e.g., from an attempt to raise the carbohydrate of the diet—occurs well before that of the diacetic acid, resulting in a considerable margin of safety at any moment as regards life.

I consider it possible that, were larger quantities of this extract available, the metabolism of the carbohydrates would improve as that of the fats has done.

I am, Sir, yours faithfully,

Broadstairs, May 17th, 1923. MARTIN O. RAVEN.

THE CAUSE OF DEATH IN ANGINA PECTORIS.

To the Editor of THE LANCET.

SIR,—Every word that falls from the lips of Sir Clifford Allbutt—the greatest living authority on angina pectoris—commands my deepest respect. Points in my own experience at variance with his are few. In his lecture on angina pectoris published in THE LANCET of May 5th Sir Clifford Allbutt lays down three postulates, with which, in the main, my experience is in accord. I am unable, however, to accept the inference suggested in the first postulate—namely, that all true cases of angina are determined by organic disease. On the contrary, I think that evidence in abundance can be put forward showing that cases of a true but functional type are very numerous.

Symptoms of functional and organic disease such as those appearing in the angina pectoris are post-reflex phenomena and represent senses and functions disturbed through morbid conditions prevalent at reflex stations. On the other hand, pre-reflex impressions are silent. They present no signs and they pass unnoticed. Hence they have no proper name in the vulgar tongue of this or any other country. It matters little whether persistent pressure on splanchnic nerves be exerted from inside or from outside the aorta, whether it come from an aneurysm or from an œsophagus distended by gas—in both instances alike, through it, the central neurosis is generated and in both events the anginous syndrome appears. When pressure impinges on vagus nerves inhibitory signs follow and sudden death is not an infrequent incident. Whether the cause be functional, as in the case of distended œsophagus, or it be organic as in aneurysm, I think the resulting syndrome merits classification under the name of true angina pectoris, whereas Sir Clifford Allbutt holds the contrary opinion. Moreover, while in agreement with the view that death in anginous disease ordinarily results from vagus inhibition, I do not think that vagus inhibition is due to pain. Never, in my own practice, has death ended a paroxysm of severe pain. In the few fatal cases of anginous disease in which opportunities of obtaining precise information were at my command, death had come during intervals between seizures.

In two cases patients died while sleeping. In neither case had a change in pose immediately preceded death. In neither had the nurse in attendance been warned by cry or groan of the approach of death. In another instance death occurred in an anginous subject who several hours before death had been alarmed by the explosion of a bomb. He was seated in my hall and my maid informed me that his gait was stumbling when he entered. He neither spoke nor uttered a sound, nor were his features expressive of pain. I raised his hand with the intention of feeling his pulse when suddenly he sank in the chair and died. Before the day of his death I had seen him on several occasions, after seizures, described by him as painful. In a fourth case the patient died after hastening home during a shower of rain. His wife left him seated in a chair before the fire. When she returned to the room a few minutes later, he was still seated and in the same pose as before, but dead. A lady who had suffered from attacks during the last ten years of her life died suddenly during a painless seizure following a meal of indigestible food. A solicitor who previously had suffered from several seizures, hastened his midday meal to attend a meeting, when rising to speak he suddenly fell back into his chair and died. Mr. G. left his house after eating a heavy midday meal. He had suffered from many seizures during the previous year. When distant from his own door about 200 yards he fell down and was picked up dead. No lesion accounting for death was found at the necropsy. All his organs were healthy. The aorta was free from disease.[1] Another patient died while running across a road to escape accident from traffic.

Pain belongs to the category of protective reflex phenomena. Rather than promoting, it opposes inhibitory action. It hardens the pulse and reduces the length of the diastolic period, and through the latter action it increases the beat rate and strengthens the beat. While engaged in taking polygraphic tracings I have had, on several occasions, the opportunity of noticing the mode of initiation of attacks and changes occurring in the curve. On the advent of severe pain, a pulse previously slow quickens its pace, through curtailment of the diastolic period and palpation at the wrist reveals the fact that contemporaneously with a quicker pace the radial artery becomes harder and less compressible. These changes in pulse-frequency and in conditions of the arterial wall indicate reduction of vagus influence and increase of splanchnic. In one case instantly after the onset of pain frequency of the pulse had increased from 46 beats a minute to 138.

Arrhythmia subsides on the advent of pain. In the series of cases already mentioned, one showed extra-systolic deflexion. After commencement of pain the irregularity no longer appeared. Cases obviously spurious are excluded from my category—namely, those of persons who die in great agony from accidental causes, such, for instance, as death from rupture of saccular and dissecting aneurysms or from hæmorrhage into the mediastinum from carcinomatous or from other new growths.

I am, Sir, yours faithfully,

H. WALTER VERDON.

Wimpole-street, W., May 12th, 1923.

THE TREATMENT OF STAMMERING.

To the Editor of THE LANCET.

SIR,—It is gratifying to know that the X ray investigation first carried out by my mother, the late Mrs. Emil Behnke, and by myself, as far back as 20 years ago, is corroborated at St. Thomas's Hospital. This further testimony to the fact, which we have always maintained, that stammering in its *physical* aspect is due to diaphragmatic spasm is welcome, because only through such knowledge, and by the correlating of cause and effect, will satisfactory results of treatment be obtained.

Mrs. M. H. Wigglesworth[2] says she does not think that the quickest way of giving a stammerer self-expression has yet been discovered, but when it is realised that diaphragmatic spasm—which can be clearly observed by means of the X rays—is usually due to nervous apprehension, and that the stammer has in the majority of cases been caused in the first place by nervous shock of some kind, it will be understood that speedy cure, though occasionally achieved, must not be expected. Long and patient work is usually needed to eradicate the psychic causes; muscle re-education will be necessary if the stammer be of long standing.

[1] THE LANCET, May 12th, p. 978.
[2] THE LANCET, April 3rd, 1915.

and the difficulties are generally increased by the fact that many stammerers are deficient in tone perception and sense of rhythm. Probably the extremely low rate of 5 per cent. of cure which has been mentioned is accounted for by the difficulty of getting patients to attend the clinic for a sufficient time and to carry out the necessary practice. The higher rate of 50 per cent. of cure obtained in the L.C.C. classes is doubtless due to the greater control obtained over such pupils, and naturally in private practice the results will be better still—my own being about 80 per cent.

I am, Sir, yours faithfully,

KATE EMIL BEHNKE.

39, Earl's Court-square, S.W., May 17th, 1923.

Medical News.

UNIVERSITY OF LONDON.—At a meeting of the Senate held on May 16th, Dr. James Calvert was appointed to represent the University at the Ninth Annual Conference on the Prevention of Tuberculosis to be held at Birmingham on July 12th and 13th next; and Dr. John Fawcett was reappointed to represent the University on the Council of the Lister Institute of Preventive Medicine for the period 1923–33.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH, ROYAL COLLEGE OF SURGEONS OF EDINBURGH, AND ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—The following candidates, having passed the requisite examinations, have been admitted Diplomates in Public Health:—

John M. Blair, John A. C. Guy, George L. Johnston, Elizabeth C. Loudon, Peter MacCallum, Patrick J. McDiarmid, Douglas O. Macdonald, Kenneth D. Murchison, George F. B. Page, Andrew G. Petrie, Ruth J. D. Ritchie, Marion Smellie, George D. Steven, Marjorie Thomson, Ruby Thomson, Peter Vieyra, William H. Wallace, and Enid Anne Williams.

The following candidates passed Part I.: Marion B. Armstrong, Catherine McLean Buchanan, Helen Campbell, William Campbell, Alisdair C. Dewar, Katrine Dunn, Margaret A. Galbraith, James S. M. Gray, Katharine J. Guthrie, James L. Halliday, Mary N. Hendry, Catherine Hill, Alexander R. Lester, William McKie, Peggy L. Mitchell, John T. Moffat, George W. Murray, David T. Richardson, Robert G. Shaw, Charles M. Smith, Elizabeth N. Thomson, Sarah B. H. Walker, and Robert H. Williamson.

The following candidates passed Part II.: George Buchanan and Joseph G. Tait.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.—At a meeting of the College held on May 16th the following candidates, having passed the requisite examinations, were admitted Fellows:—

Balvant Vaswdeo Abhyankar, Frederick G. Beatty, Isidore J. Block, Stuart Bolton, Hugh F. Briggs, Charles C. Bryan, Alister F. Cowan, Upendra Nath Das, Gerald C. Dixon, Norman M. Dott, John Dunlop, Rupert S. A. Graham, James B. Hance, Frank C. Hutchison, James F. Jefferies, Cecil E. M'Quade, Arthur G. Ord, Douglas S. Pracy, Alfred H. Proctor, Johannes Z. H. Rousseau, William O. Stevenson, and Andrew Watson.

The Bathgate Memorial Prize, consisting of bronze medal and set of books, was after a competitive examination in materia medica, awarded to Mr. Douglas Bannerman Craig. The Ivison Macadam Memorial Prize in Chemistry, consisting of bronze medal and set of books, was awarded, after competitive examination, to Mr. Henry William Bambridge.

The following candidates having passed the requisite examinations received the Higher Dental Diploma:—Nicholas Johannes Laubscher and Frederick H. Rowat.

INTERNATIONAL CONGRESS OF THALASSO-THERAPY.—The International Congress of Thalasso-therapy, which has just been held at Venice, has given rise to important communications. The main question on the agenda was the examination, from every aspect, of the factors determining biological action in diverse maritime resorts. Mr. Bagot (Roscoff) communicated results of the study of the different characteristics of the coastal resorts in modern Brittany, where the temperature is moderate, with no great cold in winter and no great heat in summer. He pointed out that the climate of these resorts is admirably adapted to sufferers from chronic diseases with general debility, while it is contra-indicated for sufferers from erethic and febrile conditions, particularly for patients with pulmonary tuberculosis. Mr. de Francesco reported on the methods followed at the Lido (Italy) in applying helio-therapeutics. Mr. Comisso (Triest) and Mr. Léo (Paris) discussed various methods of thalasso- and helio-therapy. The next Congress will meet in 1925 at Arcachon (France), when the thalasso-therapy of rickets and the analysis of its action will be discussed.

SCHOOL OF HYGIENE.—The Minister of Health, with the concurrence of the trustees of the Rockefeller Foundation, has appointed a transitional executive committee in connexion with the proposed School of Hygiene. The functions of the committee will be to appoint a director, to arrange for amalgamation or coördination between the school and other institutions working in similar or closely related spheres, to prepare plans for the new school, and to begin building, unless in the meantime it has been possible to set up the permanent governing body. The members of the committee are: Mr. Neville Chamberlain (chairman), Lord Burnham, Sir Arthur Clarke, Sir Walter Fletcher, F.R.S., Lieut.-Col. F. E. Fremantle, Sir Harry Goschen, Sir George Newman, Sir Cooper Perry, and Sir Arthur Robinson, with Mr. L. G. Brock, of the Ministry of Health, as secretary.

HARVEIAN SOCIETY OF LONDON.—The annual dinner of this society will be held at the Connaught Rooms, Great Queen-street, W.C. 2, on June 14th, at 7.30 P.M.

ROYAL INSTITUTION OF GREAT BRITAIN.—On May 31st Sir William Bayliss, F.R.S., will deliver his first lecture on the Nature of Enzyme Action. The Friday evening discourse on June 1st will be delivered at 9 P.M. by Prof. H. A. Lorentz, of Haarlem University, on the Radiation of Light.

RONTGEN SOCIETY.—The annual general meeting will be held on June 5th, at 8.15 P.M., in the Institution of Electrical Engineers, Savoy-place, Victoria Embankment, London, W.C. A paper on the Effects of X Rays of Different Wave-Lengths on Animal Tissue will be read by Prof. Sidney Russ, D.Sc., and one on the Establishment of a Definite Relationship between Exposure and Density in an X Ray Plate by Mr. T. Thorne Baker, F.I.C.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.—The annual dinner will be held at the Café Monico, under the presidency of Dr. A. G. Wells, at 7.45 P.M., on June 19th. Tickets may be obtained from Surg.-Capt. Guy Chambers, 101, Goldhawk-road, London, W. 12. On June 22nd, at 8.15 P.M., at the Kensington Town Hall, the Cavendish Lecture, entitled Speech and Cerebral Localisation, will be delivered by Dr. Henry Head, and will be followed by a conversazione, with a display by all the principal medical supply companies.

SEVENTEENTH FRENCH CONGRESS OF MEDICINE.—This Congress will take place at Bordeaux from Sept. 27th to 29th, under the presidency of Dr. X. Arnozan. The following subjects will be dealt with: (1) Late Results of Paludism (introduced by Prof. Le Dantec and Drs. Hesnard, Marcel Léger, and Broden); (2) Pathological Relationship of the Sympathetic Nervous System and the Endocrine Glands (introduced by Profs. Pachon and Perrin); (3) Treatment of Meningococcal Infections (introduced by Drs. Dopter and Boidin). The secretary to the Congress is Dr. R. Cruchet, 12, Rue Ferrère, Bordeaux.

FELLOWSHIP OF MEDICINE.—The Fellowship of Medicine have been proceeding successfully with the suggested scheme of post-graduate teaching outlined in THE LANCET, and already considerable progress has been made. The general non-undergraduate hospitals have taken up heartily the idea of the suggested grouping system for the holding of short "refresher" courses, and in some cases spontaneous offers have been received from special hospitals wishing to be included in these groups. Dates have been agreed upon for these courses up to a year hence, so that there will be a course lasting for two weeks during each month of the year. The response received from the special hospitals has been so good that it has been no light task to arrange dates so that no two special courses in the same subjects shall take place simultaneously. The complete programme for the year will be published shortly

The courses arranged for next month include a "refresher" course at the Prince of Wales's General Hospital and affiliated hospitals from June 11th to 23rd, and a course on gastro-intestinal diseases of children at the Children's Clinic, Western General Dispensary, from June 11th to July 5th. For those desiring work in the special departments of Ophthalmology, Neurology, and Dermatology, should a sufficient number of entries be received, courses beginning on June 11th and continuing for about four weeks will be given at the Royal London Ophthalmic Hospital, West End Hospital for Nervous Diseases (provisionally), and St. John's Hospital for Diseases of the Skin, respectively. Copies of the syllabus can be obtained from the Secretary to the Fellowship of Medicine, 1, Wimpole-street, London, W., to whom application for particulars regarding these and future courses should be made.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

WHITSUNTIDE ADJOURNMENT: THE CHANGE IN THE PREMIERSHIP.

PARLIAMENT adjourned for the Whitsuntide recess on Thursday, May 17th. Among the Bills to which the Royal Assent was given by Royal Commission was the Dangerous Drugs and Poisons (Amendment) Bill.

On Sunday, May 20th, Mr. Bonar Law, the Prime Minister, acting on the opinion of his medical advisers, tendered his resignation to the King, and it will be remembered that this possibility was recognised by himself at the time of his acceptance of office. Mr. Bonar Law during his brief tenure of the premiership showed qualities which have recommended him highly to all parties and sections, and his retirement is the subject of wide regret, while its cause has brought no less wide sympathy.

On Tuesday, May 22nd, it was officially announced that Mr. Stanley Baldwin, the Chancellor of the Exchequer, who had been Leader of the House of Commons in Mr. Bonar Law's absence, had been appointed Prime Minister.

HOUSE OF COMMONS.

WEDNESDAY, MAY 16TH.

Medical and Surgical Insurance Benefits.

Mr. RHYS DAVIES asked the Minister of Health what were the respective amounts set aside by Approved Societies under their schemes following the first valuation of Approved Societies for the provision of dental treatment, optical treatment, convalescent home treatment, medical and surgical appliances, and nursing, respectively.—Mr. NEVILLE CHAMBERLAIN replied: Out of the disposable surpluses of Approved Societies in England, following the first valuation, the aggregate amounts set aside for provision of the benefits in question during the five years covered by the schemes were as follows: Dental treatment, £495,000; optical treatment, £106,000; hospitals and convalescent homes, £979,000; medical and surgical appliances, £164,000; and nursing, £207,000. As regards the third item it is not possible to say what portion of the figure of £979,000 was allocated to convalescent home treatment, this benefit being included under the schemes with hospital treatment; but it may be mentioned that in addition the amount of £60,000 was set aside for the leasing and maintenance of convalescent homes by certain societies.

Medical Inspection of Employees.

Mr. GROVES asked the Minister of Labour whether he was aware that in some large firms the medical inspection of prospective employees was of such a character that ex-Service men were penalised; and whether he would make representations to the firms on the King's Roll that whenever an ex-Service disabled man was able efficiently to perform the required work his disability should not be a bar to employment.—Sir MONTAGUE BARLOW replied: If the hon. Member will furnish me with details of any case where difficulty has arisen, I shall be glad to look into the matter and see if any steps can be taken in the direction he has indicated.

Advertisements on Official Medical Forms.

Mr. THOMAS asked the Minister of Health under whose authority National Health Insurance Form Med. 40 B. (Revised) was being used for advertising Maypole for butter and tea; the amount gained by these advertisements; and the purpose to which the money was applied.—Major BOYD-CARPENTER replied: In view of the urgent need for exercising every possible economy in public expenditure, the Government has decided that official publications and forms which can be used as a medium for advertisement should be so used. The general arrangements for putting this decision into operation are in the hands of the Controller of His Majesty's Stationery Office, but before any advertisement is inserted on forms issued by or on behalf of any public department the Controller consults that department. The objections to the insertion of an advertisement on Form Med. 40 B. were considered, but were not deemed to be so great as to justify a departure from the general rule that available space should now be used for advertisements unless the insertion of an advertisement actually operated against the effective use of the form. With regard to the second part of the question the net income derived from the advertisement is £135. This revenue is applied as an appropriation in aid of the Stationery Office vote, on which vote the cost of producing the forms is borne.

Criticisms of the Panel System.

Mr. JARRETT asked the Minister of Health whether his attention had been called to recent criticisms of the panel system under the National Health Insurance Act; and whether he would institute an inquiry into the working of the Act.—Mr. HURD asked the Minister of Health if he would institute an independent inquiry into the working of the panel system under the National Health Insurance Acts, so as to ascertain how best to remedy the defects revealed in ten years' working of the system.—Mr. NEVILLE CHAMBERLAIN replied: I am aware of recent criticisms of the panel system, which in a service of this magnitude are, I fear, inevitable. The revision of the terms of service of insurance practitioners with a view to securing a more efficient medical service under the Insurance Acts has been fully examined in consultation with the Insurance Consultative Council and the Insurance Acts Committee of the British Medical Association, and I do not consider that any useful purpose would be served by such an inquiry as the hon. Members suggest.

Small-pox and Vaccination.

Mr. BECKER asked the Minister of Health if, seeing that the cases and suspected cases of small-pox notified for 1921 were 336 cases, for 1922 were 979 cases, and for the first three months of 1923 520 cases, he could state the causes of the great increase of small-pox this year; if the disease was on the increase or decrease during April; and had he information indicating that the objection of people to being vaccinated was one cause for the increase.—Mr. NEVILLE CHAMBERLAIN replied: I am advised that the recent increase of small-pox may be attributed to the widespread neglect of vaccination and revaccination, and to the fact that small-pox is a disease of seasonable prevalence, the maximum incidence usually occurring at the end of the first quarter of the year. The number of cases notified in April was 139, as compared with 215 in the previous month.

Opticians as Dentists.

Colonel Sir ARTHUR HOLBROOK asked the Minister of Health whether he would consider an amendment to the Dentists Act which would enable opticians who had hitherto practised also as dentists to be placed on the same footing as dentists with regard to registration.—Mr. NEVILLE CHAMBERLAIN replied: So far as I am aware the particular combination of occupations to which my hon. and gallant friend refers is not sufficiently common to justify amending legislation.

Treatment Allowances to Ex-Service Men.

Mr. SHINWELL asked the Minister of Pensions what allowances were paid to ex-Service men at present in military hospitals on treatment when travelling to and from their homes on leave; whether any reduction on the allowance had been authorised recently; and if the allowance was subject to variation.—Captain CRAIG replied: Men undergoing extended in-patient treatment, who are receiving ordinary treatment allowances, may be granted leave, with free return tickets at six monthly intervals, or with single journey tickets at three monthly intervals. The treatment allowances in issue, in lieu of pension, continue to be paid during authorised leave but no additional subsistence allowance is paid. There has been no recent change in leave arrangements.

Disability Appeals.

Mr. BROTHERTON asked the Minister of Pensions whether an ex-Service man was allowed to appeal either to the entitlement or to the assessment tribunal in a case where the medical officers of the Ministry expressed the opinion that there was no disability; and, if not, would he arrange that a man should have the right of appeal in all cases where his private medical attendant certified that he was suffering from a disability due to war service.—Captain CRAIG replied: My right hon. friend has recently had this class of case, which is of rare occurrence, under his consideration, and although it is open to doubt whether in strictness they come within the terms of Section 8 of the War Pensions (Administrative Provisions) Act, 1919, arrangements will, it is hoped, be made to allow appeals to the Pensions Appeal Tribunal where the Ministry medical boards find no disability.

THURSDAY, MAY 17TH.

Blind and Crippled Children.

Mr. FOOT asked the President of the Board of Education the number of blind and crippled children, respectively, throughout the country for whom no educational provision was being made.—Mr. E. WOOD replied: There are about 500 blind or partially blind children and about 1300 crippled children for whom provision is not made in recognised schools or educational institutions.

Children and Tuberculosis.

Mr. FOOT asked the President of the Board of Education if there were any statistics available showing the number of children throughout the country suffering from tuberculosis for whom no educational provision was being made.—Mr. E. WOOD replied: The relevant statistics of the Board divide children into two categories, those ascertained at

medical inspection to be suffering from pulmonary tuberculosis and those ascertained to be suffering from crippling due to tuberculosis. According to the latest returns furnished by local education authorities, the number of children in the first category is, approximately, 20,000, of whom about 2000 are in special schools, 11,000 are in public elementary schools, and 7000 are attending institutions not certified by the Board or are not at school. In the second category, there are 13,000 children, of whom 1700 are in special schools, 6500 are in public elementary schools, and 4800 are attending institutions not certified by the Board or are not at school. It will be understood that such of these children as are in attendance at public elementary schools are not suffering from tuberculosis in an infectious form. Provision is made in the Code for the exclusion from public elementary schools by the school medical officer of any child whose presence might involve the spread of disease.

Excess of Births Over Deaths.

Captain WEDGWOOD BENN asked the Minister of Health what had been the excess of births over deaths in each year from 1865 to 1921, inclusive; and what was the number of marriages in 1921.—Mr. NEVILLE CHAMBERLAIN replied: In England and Wales the number of marriages in 1921 was 320,852. The excess of births over deaths in the years mentioned in the question is shown in the attached table:—

Year.	Excess.	Year.	Excess.	Year.	Excess.	Year.	Excess.
1865	257,160	1880	353,019	1894	391,462	1908	419,927
1866	253,181	1881	391,707	1895	353,294	1909	396,469
1867	297,276	1882	372,360	1896	388,604	1910	413,715
1868	306,236	1883	367,725	1897	380,196	1911	353,328
1869	278,553	1884	375,922	1898	371,024	1912	385,798
1870	277,458	1885	371,520	1899	346,847	1913	376,915
1871	282,549	1886	366,484	1900	339,232	1914	362,354
1872	333,642	1887	355,573	1901	378,222	1915	252,361
1873	337,258	1888	368,897	1902	404,971	1916	277,303
1874	328,324	1889	367,591	1903	433,643	1917	169,424
1875	304,154	1890	307,689	1904	395,605	1918	50,800
1876	377,653	1891	326,232	1905	409,262	1919	188,235
1877	387,704	1892	338,273	1906	403,800	1920	491,652
1878	352,034	1893	344,614	1907	393,821	1921	390,185
1879	354,134						

Clinics for Physically Defective Children.

Mr. FOOT asked the President of the Board of Education the number of local education authorities who had established clinics for the treatment of physically defective children and the number of authorities who had not yet established such clinics.—Mr. E. WOOD replied: Out of the 318 local education authorities in England and Wales, 297 have established clinics for the medical treatment of school-children found to be suffering from physical defects.

Medical Boards and Final Awards.

Mr. RITSON asked the Minister of Pensions whether the instructions to medical boards held in cases for final awards provided that the doctors should estimate the man's physical condition at the end of two years and assess the degree of disablement on the then probable condition; whether these instructions applied in the cases of men suffering from tuberculosis; and, if so, in view of the nature of that disease, would he issue instructions that final awards should only be given to men suffering from tuberculosis when the degree of disablement was 100 per cent.—Major TRYON replied: There is no such instruction. The regulations require that a man who has been on the pension list four years or more shall be considered for final award; and medical boards are instructed to furnish an assessment for the purpose of such final award unless the man is likely to get materially better or worse within a period not exceeding two years. The Boards are advised that cases of tuberculosis will, generally speaking, be found unsuitable for final award, but that each case should be considered on its merits. As at present advised, I am not prepared to modify the instructions.

Pensioners and Valvular Disease of the Heart.

Mr. ROBERT RICHARDSON asked the Minister of Pensions how many final awards had been made in cases of men suffering from valvular disease of the heart; whether in any case the award was a final weekly allowance; whether he was aware that, in the opinion of cardiac specialists, the majority of cases of valvular disease of the heart were likely to become materially worse and that it was not possible to say what the pensioner's condition would be at the end of two years; and whether he would issue instructions that final awards should not be made in cases diagnosed as valvular disease of the heart unless the degree of disablement was certified to be 100 per cent.—Major TRYON replied: I regret that the form in which the records of my department are kept do not enable me to distinguish readily between valvular disease of the heart and other forms of heart disease. The instructions relating to making of final awards recognise the probability that cases of valvular disease of the heart will deteriorate. Medical boards are, in fact, advised that cases of this nature will ordinarily be found unsuitable for final awards, but that each case should be considered on its merits.

Assessments by Re-Survey Boards.

Mr. MUIR asked the Minister of Pensions whether, seeing that in certain cases men were not informed of the decision of the medical board when they attended for re-survey, and that this applied particularly to men suffering from a disease aggravated by war service, what was the reason for withholding from these men information as to their degree of assessment.—Major TRYON replied: There is no instruction that men with aggravated disabilities are not to be told their assessments by re-survey boards. Where, however, a board finds it necessary to obtain a specialist's opinion, or where the case is one of difficulty, the position is explained to the man and he is informed later of the result of his examination. I may add that the final decision as to the rate of assessment always rests with a medical board which has examined the man.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Monday, May 28th.

ODONTOLOGY: at 8 P.M.
Annual General Meeting:
Election of Officers and Council for 1923–24.
Paper: Dr. Sim Wallace: Observations on the Progress of Preventive Dentistry.

Tuesday, May 29th.

MEDICINE: at 5.30 P.M.
Annual General Meeting:
Election of Officers and Council for 1923–24.
Cases:
Cases will be shown and discussed as follows:—
Dr. Parkes Weber: A case of Jaundice of 15 Years' Duration without Impairment of Health.
Dr. J. A. Ryle: A case of Splenomegalic Polycythæmia with Cerebral Hæmorrhage.

Thursday, May 31st.

UROLOGY: at 8.30 P.M.
Annual General Meeting:
Election of Officers and Council for 1923–24.
Paper:
Mr. Jocelyn Swan: Carcinoma occurring in Clinically Innocent Enlargement of the Prostate.

SOCIETY OF MEDICAL HYDROLOGY.
TUESDAY, May 29th.—(At the University of London, South Kensington.) Lectures and Demonstrations on Medical Hydrology. (To be continued on Wednesday, Thursday, Friday, and Saturday.)

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE POST-GRADUATE LECTURES, 1, Wimpole-street, W.
WEDNESDAY, May 30th.—5.30 P.M., Mr. Ernest Clarke: Tips in Ophthalmology for the General Practitioner.

LONDON HOSPITAL MEDICAL COLLEGE, Mile End, E.
TUESDAY, May 29th.—5.15 P.M., Dr. Millais Culpin: Treatment in Psycho-neurosis.
WEDNESDAY.—4.15 P.M., Dr. W. M. Feldman: Fœtal Physiology.
FRIDAY, June 1st.—4.15 P.M., Mr. Russell Howard: (Lecture on Surgery) The Testicle. 5.15 P.M., Dr. Millais Culpin: Treatment (2).

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.
MONDAY, May 28th.—12 noon, Mr. Simmonds: Applied Anatomy. 2 P.M., Mr. Bishop Harman: Eye Dept. 3 P.M., Mr. Simson: Diseases of Women.
TUESDAY.—10 A.M., Mr. Steadman: Dental Dept. 12 noon, Dr. Burrell: Chest Cases. 2.30 P.M., Mr. Tyrrell Gray: Surgical Wards.
WEDNESDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 12.15 P.M., Dr. Burnford: Medical Pathology. 2 P.M., Mr. Gibb: Eye Dept.
THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Dept. 2 P.M., Mr. Bishop Harman: Eye Dept. 2 P.M. Mr. MacDonald: Genito-Urinary Dept.
FRIDAY, June 1st.—10 A.M., Dr. Drummond Robinson: Gynæcological Dept. 2 P.M., Mr. Banks-Davis: Diseases of Throat, Nose, and Ear.
SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations, Nose, Throat, and Ear.
Daily, 10 A.M., to 6 P.M., Saturdays 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James's Hospital, Ouseley-road, Balham, S.W.
THURSDAY, May 31st.—4.30 P.M., Dr. H. Crichton Miller: Toxins, Endocrines, and Emotions.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
Demonstration of Clinical Cases at 3.30 P.M.
MONDAY, May 28th.—Dr. J. Browning Alexander: Medical.
TUESDAY.—Mr. J. Howell Evans: Surgical (3 P.M.).
WEDNESDAY.—Mr. Norman B. Fleming: Eye Cases.
THURSDAY.—Mr. H. W. Carson: Surgical.
FRIDAY, June 1st.—Dr. C. E. Sundell: Diseases of Children.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, Queen-square, Bloomsbury, W.C. 1.
POST-GRADUATE COURSE: MAY–JUNE, 1923.
CLINICAL LECTURES AND DEMONSTRATIONS.
MONDAY, May 28th.—2 P.M., Out-patient Clinic: Dr. Hinds Howell. 3.30 P.M., Ophthalmic Herpes: Mr. Paton.
TUESDAY, May 29th.—2 P.M., Out-patient Clinic: Dr. Grainger Stewart. 3.30 P.M., Syphilitic Disease of Nervous System: Dr. Adie.
THURSDAY, May 31st.—2 P.M., Out-patient Clinic: Dr. Kinnier Wilson. 3.30 P.M., Pituitary Disease: Dr. Gordon Holmes.
FRIDAY, June 1st.—2 P.M., Out-patient Clinic: Dr. Gordon Holmes. 3.30 P.M., Trauma in Relation to Nervous Disease: Dr. Collier.
COURSE OF LECTURES ON NEURO-PATHOLOGY.
MONDAY, May 28th.—12 noon, Paths of Infection on Central Nervous System: Dr. J. Godwin Greenfield.
A COURSE of 12 LECTURES on the ANATOMY AND PHYSIOLOGY OF THE NERVOUS SYSTEM will be given at 12 noon on TUESDAYS and FRIDAYS if there are sufficient entries for it.
Mr. Armour and Mr. Sargent operate at the Hospital on Tuesday and Friday mornings at 9 A.M., or at such other times as may be announced.
The fee for the whole Course is £12 12s., including Anatomy and Physiology, but these Lectures may be taken separately for a fee of £4 4s. The fee for the Course without Anatomy and Physiology Lectures is £10 10s. Special arrangements as to fees will be made for those unable to take the whole Course. Fees should be paid to the Secretary of the Hospital at the office on entering for the Course.
C. M. HINDS HOWELL, Dean of Medical School.

MEDICAL OFFICERS OF SCHOOLS ASSOCIATION, 11, Chandos-street, Cavendish-square, W.
TUESDAY, May 29th.—5 P.M., Dr. Alice E. Sanderson Clow: The Effects of Physical Exercise on Menstruation.

INSTITUTE OF PATHOLOGY AND RESEARCH, St. Mary's Hospital, Paddington, W.
THURSDAY, May 31st.—4.30 P.M., Dr. Leonard Hill: New Ideas concerning the Biological Action of Light.

LONDON SCHOOL OF MEDICINE FOR WOMEN, 8, Hunter-street, W.C.
TUESDAY, May 29th.—5 P.M., Prof. A. L. McIlroy: Hæmorrhage in Pregnancy.

LONDON LOCK HOSPITAL, 91, Dean-street, W. 1.
MONDAY, May 28th.—5 P.M., Mr. Charles Gibbs: Ante-natal and Post-natal Treatment of Syphilis.
TUESDAY.—2.30 P.M., Mr. J. E. R. McDonagh: Microscopic Demonstration of Leucocytozoon Syphilidis. At 283, Harrow-road, W. 9.
WEDNESDAY.—3 P.M., Mr. Ernest Lane: Treatment of Gonorrhœa in Women.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY, May 31st.—4 P.M., Mr. Higgins: The Acute Abdomen.

INFANTS HOSPITAL, Vincent-square, S.W. 1.
MONDAY, May 28th.—6 P.M., Dr. Eric Pritchard: Rickets.
TUESDAY.—8.45 P.M., Mr. M. S. Mayou: Prophylaxis and Treatment of Common Diseases of the Eye in Children.
THURSDAY.—6 P.M., Dr. Eric Pritchard: Weaning and Feeding up to 5 Years.
FRIDAY, June 1st.—8.45 P.M., Dr. H. MacCormac: Treatment of Eczema in Infants.

QUEEN CHARLOTTE'S LYING-IN HOSPITAL, Marylebone-road, N.W.
THURSDAY, May 31st.—5 P.M., Mr. Aleck W. Bourne: Puerperal Sepsis.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE LECTURES.
TUESDAY, May 29th.—4.15 P.M., Mr. W. R. Douglas: Chronic Appendicitis.

UNIVERSITY OF BRISTOL POST-GRADUATE DEMONSTRATIONS.
MONDAY, May 28th.—At Hereford, Dr. C. E. K. Herapath: Tachycardia.
THURSDAY.—At Bristol, Prof. Walker Hall: Normal and Acquired Resistance to Disease.

Appointments.

CURTIS, H., F.R.C.S. Eng., has been appointed Consulting Surgeon, Metropolitan Hospital, London.

DUNSCOMBE, C., B.Ch. Camb., M.R.C.S., L.R.C.P. Lond., D.P.H. Oxf., Resident Medical Officer to the Brighton Isolation Hospital and Sanatorium.

GIBSON, J. M., M.D., D.P.H. Belfast, Medical Officer of Health and School Medical Officer for the Urban District of Radcliffe, Lancashire.

MACLEAN, N. A., M.B., Ch.B. Glasg., House Surgeon, Addenbrooke's Hospital, Cambridge.

RADLEY, S. B., M.B. Lond., F.R.C.S. Eng., Honorary Surgeon to the Newark and District Hospital.

Certifying Surgeons under the Factory and Workshop Acts: MORRIS, S. G., M.D., C.M. Edin. (Rhondda, Porth); COHEN, S. M., M.D., B.S. Lond. (Rhondda, Treorchy).

Vacancies.

For further information refer to the advertisement columns.

Birkenhead Borough Hospital.—Hon. Radiologist.
Blackburn County Borough.—Asst. M.O.H., &c. £600.
Bradford Royal Eye and Ear Hospital.—Hon. Ophth. S.
Calcutta.—Port Health Officer. Rs.1200 per mensem.
Carmarthenshire Education Committee.—Chief Sch. M.O. £700.
Chelsea Hospital for Women, Arthur-street, S.W.—Registrar. £50. Also H.S. £120.
Colindale Hospital, Hendon, N.W.—Jun. Asst. M.O. £515 6s.
Dreadnought Hospital, Greenwich, S.E.—H.S. £150.
Dundee Royal Infirmary.—Asst. Radiologist.
Elizabeth Garrett Anderson Hospital, Euston-road.—Asst. S.
Essex County, Halstead and Belchamp United Sanitary Districts.—M.O.H. and Asst. County M.O. £750.
Glasgow, Gartloch Mental Hospital.—Locum Tenens. £350.
Gloucestershire Royal Infirmary.—Asst. S.
Hertford County Sanatorium, Ware Park, near Ware.—Asst. M.O. £300.
Hospital for Sick Children, Great Ormond-street, W.C.—H.S. £50.
Hull Royal Infirmary.—Hon. Asst. S.
Jamaica, Parochial Board of Clarendon.—M.O.H. £600.
Kingston Union Hospital.—Asst. Res. M.O. £400.
Lancaster County Mental Hospital.—Asst. M.O. £590.
Leeds University.—Lecturer in Bacteriology. £500.
Liverpool Hospital for Cancer and Skin Diseases.—Hon. Asst. S.
Maidstone, Kent County Ophthalmic Hospital.—H.S. £300.
Mount Vernon Hospital for Tuberculosis, Northwood, Middlesex.—Asst. Res. M.O. £200.
Northamptonshire County Council Education Committee.—Asst. School M.O. £500.
Oxford, Radcliffe Infirmary and County Hospital.—H.P. £200.
Preston, Lancs, Whittingham County Mental Hospital.—Pathologist Asst. M.O. £590 17s.
Queen Mary's Hospital for the East End, E.—Cas. O. £150.
Royal Free Hospital, Gray's Inn-road, W.C.—H.P., H.S., Asst. Cas. O., Obstet. H.S. Also H.S. and Obstet. Asst. £50.
Royal Northern Hospital, Holloway, N.—Ophth. S.
St. Lucia, Victoria Hospital.—Res. S. £500.
St. Mary's Hospital for Women and Children, Plaistow, E.—Hon. P. and Hon. Asst. P.
Salford Union Infirmary, Hope, Pendleton, near Manchester.—Second Asst. Res. M.O. £250.
Salop County Council.—Asst. M.O. £550.
Sheffield, Jessop Hospital for Women.—Asst. H.S. £100.
Staffordshire County Mental Hospital, Cheddleton, near Leek.—Locum Tenens Asst. M.O. 7 guineas weekly.
Ventnor, Isle of Wight, Royal National Hospital for Consumption.—Asst. Res. M.O. £300.
Welsh Board of Health.—Female M.O. £600.
Western Australia Lunacy Department.—Sen. Asst. M.O. £552.
West London Hospital, Hammersmith-road, W.—H.P. and H.S. Each £100. Also Asst. Anæsth. and Hon. Med. Radiologist.
Windsor, King Edward VII. Hospital.—Sen. H.S. £200. Also Jun. H.S. £150.

Births, Marriages, and Deaths.

BIRTHS.

DAWSON.—On May 13th, at "Brooke," Torquay, the wife of Captain F. G. L. Dawson, R.A.M.C., of a daughter.
GREENWAY.—On May 9th, at Plumstead High-street, the wife of Dr. Chas. M. Greenway, of a daughter.
PATTERSON.—On May 14th, at Pirbright, Surrey, the wife of Captain A. F. L. Patterson, D.S.O., R.A.M.C., of a daughter.
ROBERTS.—On May 16th, at the Parsonage, Kuala Lumpur, F.M.S., to Dorothy M. Roberts, M.B., Ch.B. (née Somerville), the wife of Rev. B. C. Roberts—a son.

MARRIAGES.

KEANE—CHAPMAN.—On May 16th, at Westminster Cathedral, by Rev. Father Keane, Rector of Campion House, Oxford, Major Gerald J. Keane, D.S.O., to Auriol Frances Kyrle Chapman.

DEATHS.

GARMAN.—On May 14th, at Oakeswell Hall, Wednesbury, Walter Chancellor Garman, M.D. Edin., J.P.
ROBERTSON.—On May 13th, at Simla, India, of heart failure following pneumonia, Colonel James Currie Robertson, C.M.G., C.I.E., C.B.E., I.M.S.
SWAINSON.—On May 16th, suddenly, James Midleton Graham Swainson, F.R.C.S., Elms-road, Clapham, and Welbeck-street, in his 51st year.
WILLEY.—On May 16th, at Somersfield, Reigate, Surrey, Henry Willey, M.D., F.R.C.S., aged 84 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

THE PATHOLOGICAL GALL-BLADDER.*

BY ARIAL W. GEORGE, M.D.,
ASSISTANT PROFESSOR OF ROENTGENOLOGY, TUFTS COLLEGE MEDICAL SCHOOL, BOSTON.

AFTER referring to the pleasure with which he had accepted the invitation to come to England and discuss the subject of the pathological gall-bladder, and expressing the belief that the English-speaking peoples lead, and should continue to lead, in this specialty, Dr. George continued as follows:—

No one can approach the gall-bladder problem without being familiar with the work of Robert Knox. To my colleague Dr. Leonard and myself, this work of Knox was probably our greatest stimulus in our early work upon gall-bladder disease and gall-stones. Yet possibly we were a little discouraged in a careful analysis of his work, because of the fact that there was a large group of gall-stones not visible to the X ray, owing to their physical qualities. In the early days, when we attempted to carry out the study of the duodenum by the plate method introduced by Cole, of New York, we occasionally found shadows either distinctly due to gall-stones or very suggestive of gall-stones. We spent a great deal of effort, time, and study to determine in each and every case that came through our clinic whether stones existed or not. After having had considerably more success than we at first hoped for, we realised that many cases showed indefinite shadows only *suggestive* of gall-stones in shape, size, position, and a certain amount of increased density; the question therefore arose whether these shadows might be due to a collection of stones in the gall-bladder. Through a period of time when we met with discouragement from every angle, especially from our colleagues in the demonstration of these cases, in a good many cases, where we thought by the density of the shadow and by the shape that we were possibly dealing with gall-stones, we found at operation that the gall-bladder did not contain stones, the shadows being due either to thickening of the gall-bladder wall, inspissated bile, or very thick and dark bile. We became convinced after a series of these cases that we were actually making visible the gall-bladder itself. Thus we changed our opinion, or our method of reporting, and considered it as "the pathological gall-bladder."

Invisibility of Normal Gall-Bladder.

It then became perfectly obvious from previous experience in gastro-intestinal work, especially the study of the upper right quadrant, that we were not yet able to make visible the *normal* and *healthy* gall-bladder, and I believe that this statement holds to-day, although there may be an occasional exception to this rule—that is, there may be times when we do show the normal gall-bladder. Thus, when we made visible a shadow in the upper right quadrant consistent in size, shape, and position with what we understand to be the gall-bladder, we considered this to be a pathological gall-bladder with or without gall-stones. The effort of our colleagues and of most of the rontgenologists seemed to be aimed at proving that they could demonstrate the normal gall-bladder rather than trying to demonstrate the pathological gall-bladder. For a time we, in our clinic, stood alone in the study of the pathological gall-bladder; only within recent months has there been a general change of opinion, brought about largely by Kirkland, of Muncie, Indiana, who was associated with me on war service. On his return to civil practice Kirkland, being in a part of the country where gall-bladder disease and gall-stones are apparently common, made in a year or two a collection almost equalling ours in numbers, carrying out his work along the same lines. He was invited to the Mayo Clinic for two months to X ray the gall-bladder cases which were to be operated on, having been diagnosed as gall-bladder disease or stones from the clinical history. Though I have not his exact figures, it is reported that he made 92 per cent. correct diagnoses in a series of cases operated upon, well over 100 in number. This seems a startling but very satisfactory demonstration of individual ability to make this study exact and worth while.

Later, as we perfected the technique of the examination of the upper right quadrant, there came a time when we needed, in a large number of cases, other evidence to help substantiate the visible gall-bladder, so we began to enumerate and classify observations which we called "indirect evidence" or "secondary evidence." We prefer the latter term.

Pressure Deformity.

We found that the normal healthy gall-bladder did not cause pressure so that it would outline itself upon the barium mass. We also found, however, that when we obtained this pressure deformity of a certain character it was almost conclusively due to the gall-bladder, and in almost every instance to disease of the gall-bladder—in other words, we were dealing with a pathological gall-bladder.

We classify this filling defect, or pressure deformity, in various ways. The effect of the gall-bladder is upon the first portion of the duodenum, in both the antero-posterior and lateral diameters. We may find in the gastro-intestinal examinations deformity of the first portion of the duodenum due to various causes, such as poor filling of the cap at the moment of exposure, malposition of the stomach for various reasons, either normal or abnormal, spasm at the pylorus, adhesions, and ulcer. I believe that most of us can recognise the characteristic changes of ulcer as easily as cancer of the stomach. There may be unusual deformities, sometimes hard to differentiate from ulcer, but we have our method of determining this with more or less certainty.

In deformity due to a gall-bladder we have a definite and tangible shadow, which we have termed a "half-shadow," due to the concave or rounded surface of the gall-bladder pressing against the similar surface of the duodenum. If the edge of the liver, which is a flat surface, presses against the duodenum, we lack this "half-shadow" as we have no concavity to produce this half-shadow. My own colleagues in America have not seemed to grasp the fundamentals of pressure deformity due to the gall-bladder; the interpretation or differentiation of pressure deformity due to a gall-bladder in contradistinction to that of a liver edge must be understood and recognised to make what I am going to say clear and easy to interpret.

Causation of Pressure.

Why should the gall-bladder cause this pressure? In the first place, we have pathological gall-bladders with no adhesions, and a great many with adhesions between the gall-bladder and the duodenum. The chances are that at some period of the examination or examinations there will be tension within a pathological gall-bladder greater than the tension within the duodenum when filled with barium. We conclude that when the stomach is in either the prone or lateral position it cannot, in view of the power exerted by gravity, peristalsis, and the weight of the barium mass, push to one side a gall-bladder in close approximation to the duodenum; we then have the feeling that tension is greater in the gall-bladder than in the duodenum. We admit that occasionally one finds a perfectly healthy gall-bladder which for a short period of time is under tension, but which empties itself sooner or later. On the other hand, a gall-bladder under tension with power to impose itself upon the first portion of the duodenum is potentially pathological in some degree.

Unfortunately, we must admit that under ordinary circumstances fluoroscopy does not help to determine these facts; the latter can only be obtained with the most careful plate or film method. Many cases show deformity not in the prone position, but only in the lateral position, so that all views must be taken. Many cases show pressure deformity of the gall-bladder upon the first portion of the duodenum in the lateral position, but they more frequently show the picking up of the second portion of the duodenum and its extension back toward the spine in the horizontal position. With gall-stones of the type invisible to X rays we occasionally see a serrated edge to the shadow produced by the gall-bladder against the duodenum.

I have no statistics as to the relative frequency of pressure deformity and pathological gall-bladder, but Dr. Leonard and I feel more convinced to-day than ever that this deformity is one of our strongest links in the chain of evidence toward the diagnosis of a pathological gall-bladder.

Involvement of Second Portion of the Duodenum.

The second important structure involved—although perhaps not so frequently as the first portion of the duodenum—is the second portion. Those who have carried out one method of procedure covering a large series of cases over a long period realise the position of the average normal stomach. In the prone position we find that the second portion of the duodenum extends downward parallel to the vertebræ, until it reaches its third portion, where it passes upwards and behind the stomach; the position of the second portion has a great significance in the diagnosis not only of gall-bladder disease but of other conditions.

Except in very stout or very poorly-nourished patients, or in those with scoliosis or some skeletal defect which gives rise to change in the organs generally, the position of the second portion of the duodenum is constant as above outlined; a very common change due to gall-bladder disease is the picking up of the second portion of the duodenum outward toward the liver, and in quite a number of cases the size of the gall-bladder can be outlined by the position of the second portion of the duodenum. In the study of the pancreas, changes in the second portion form our most important diagnostic sign. In the lateral position instead of

* An abstract of the Mackenzie-Davidson Memorial Lecture, read at the First Annual Joint Meeting of the Rontgen Society and the Electro-Therapeutics Section of the Royal Society of Medicine on May 17th, 1923.

the second portion of the duodenum passing downward and parallel to the vertebræ, it often takes a backward curve, depending upon the size of the head of the pancreas. With a nodular pancreas this pressure deformity of the nodules will be seen on the barium-filled second portion of the duodenum so clearly that there is no great difficulty in the interpretation. Again, in the lateral position, a duodenum that passes backward toward the vertebræ and then forms an angle passing downward again to its normal position is most significant of gall-bladder disease. Burnham, of San Francisco, at a meeting of the American Roentgen Ray Society in September, 1922, definitely brought out this observation in a large series of cases.

In dealing with retroperitoneal tumours—for example, sarcoma—the duodenum will be found to be pushed in the opposite direction, and the tumour mass will be outlined upon the posterior portion of the duodenum; it can be detected by the new position which the second portion of the duodenum takes as compared with the normal.

It is, of course, unnecessary to say that the best results will be obtained by the plate or film method; with sufficient experience this observation can be detected fluoroscopically. An exception to general rules is the post-operative case; all the above observations may be valueless because of fixation, omental and otherwise. All cases that have had previous abdominal operation, especially of the upper right quadrant, are difficult to interpret, as normal relations are so definitely disturbed in some instances. We cannot urge too strongly a careful consideration of all these facts relative to gall-bladder disease. The second portion of the duodenum plays its most important part in the diagnosis of the gall-bladder region.

When the duodenum passes outward toward the liver and then proceeds downward to its normal position we must consider that this position of the duodenum is due definitely to *fixation*, and in only rare exceptions will this be found to be due to other than gall-bladder adhesions.

Pressure upon the Antrum.

Pressure of the gall-bladder upon the antrum of the stomach will occur as frequently as pressure deformity on the first portion of the duodenum; in a large number of cases it will be found on the first portion of the duodenum, extending to the antrum. In this observation we must look for the half-shadow effect. Another observation of value is the transposition of the jejunum from its normal position from the left to the upper right quadrant. This has frequently been of assistance to us in the determination of gall-bladder disease; but we appreciate from experience that tuberculous or other peritonitis earlier in life may be the cause. It is remarkable how easily the gall-bladder throws out adhesions and picks up adjacent structures.

Filling of the Ampulla of Vater.

A fourth observation of relatively common occurrence, but possibly not of quite such definite value, is the filling of the ampulla of Vater. We have found, in every instance in which we have had the cases operated upon, that if we could show the ampulla full of barium throughout a series of gastro-intestinal plates or films, this was significant of one of two conditions—gall-bladder disease or disease of the pancreas. We know, of course, that changes frequently occur in the pancreas secondary to chronic gall-bladder disease. At one time we kept a record of a series of these visible ampulla cases operated upon for gall-bladder disease and other conditions to the number of 27; in every instance they displayed disease either of the gall-bladder or of the pancreas, or both. If all the other indications outlined are absent or cannot be demonstrated, and if we find only the filling of the ampulla of Vater, we feel that we have neglected for one reason or another to obtain the most satisfactory results from this method throughout the examination.

Change in Position of Proximal Portion of Transverse Colon.

Another observation that can be mentioned and which is of considerable importance is the change in position of the proximal portion of the transverse colon. In a way it forms a secondary hepatic flexure, or, as we have sometimes called it, a "pseudo-hepatic flexure." Very often in the absence of all other signs this change of the transverse colon will be present and will constitute the *only diagnostic* sign pointing to the gall-bladder.

One other diagnostic factor brought forward by Carman, Burnham, and others, which we have felt was not entirely reliable, is so-called spasm which occurs in the antrum of the stomach. Possibly this should be observed with the fluoroscope rather than with plates or films; we do not attach any considerable significance to it, unless it appears in conjunction with other signs which make the diagnosis positive.

It can be readily seen that if the observations which I have enumerated are reliable we have considerable evidence to help towards the diagnosis of a pathological gall-bladder or stones, aside from the visible gall-bladder. To me this makes the work still more satisfactory, because we are not depending upon one diagnostic observation but upon numerous ones, any one of which may be of the utmost importance in a given case.

Negative Value of X Rays.

Many have asked the question, "What is the negative value of X rays?" We feel, perhaps more strongly than ever, that if we have evidence which makes for a *positive diagnosis*, then the absence of all of this evidence has some value towards the negative aspect of the study. We are sure that with a proper examination, a given case of actual pathological processes of the gall-bladder can be in almost every instance recognised by changes manifested in the plate or film of the X ray examination. There are unquestionably degrees of pathological processes, such as mild cholecystitis, which do not change the quality of the bile to any extent or give rise to thickening of the bladder wall. I believe that *even* in these cases we can, with carefully taken films, bring out secondary evidence of diagnostic importance. Even with cholesterin stones, which are usually in numbers, if we have a large number we have mass, and if we have mass we have increased density. It may not always be possible to recognise individual stones, but with increased density, and taking into account the shape of the gall-bladder, we can be pretty sure that we are dealing with a chronic gall-bladder or with stones or both.

The question is then asked: "Why, when we have simply microscopical changes in the gall-bladder wall, can we detect these changes with X rays?" So far as our experience is concerned, and so far as we can find from the literature, the moment infection takes place in the gall-bladder there is change in the tissue of the gall-bladder, and immediately, or very soon, the bile becomes turbid, cloudy, considerably darker, and more tar-like. We found in a series of laboratory tests that this bile, as it darkens in colour from the normal, becomes denser in quality, with increase of opacity. We have had gall-bladders removed and with an immediate specific gravity test of the bile found it was double the normal. It is perfectly obvious that with this increase in density, or specific gravity, this condition is more easily recognisable with X rays.

Perseverance Necessary.

We have been asked many times by our colleagues, especially of the younger group, why we can show things so constantly when they are unable to do so with the same apparatus and with the same type of patient. Perhaps that question can be answered by stating that one big factor in gall-bladder work, aside from the necessary apparatus and facilities, is perseverance. The investigator should continue his work in an individual case until he has obtained, through a series of films, a most satisfactory film from every angle. This means that the patient must be absolutely at rest without breathing. The technique, the quality, and the exposure value must be exact for the individual case; for this there is no standard. The second big factor in this study seems to me to be a willingness to look for changes and to admit that the latter exist and can be found.

I think that, in view of our experience covering a number of years and a large series of cases, we have in the use of X rays a definite method of examination of the upper right quadrant. If we do not reach 100 per cent. of correct diagnoses, this does not relegate the method to a second place, for our percentages are as high as can be expected in any branch of medical science. Up to the present time no one method touches perfection, but our endeavour should be to make our practice in this specialty as near 100 per cent. as it is humanly possible.

SANITARY ADMINISTRATION IN THE PUNJAB.*

THE population of the Punjab, for which statistics are given in this report (that is, the civil population, less that of cantonments, of the Punjab States, and of the Biluch Trans-Frontier Tract) was, according to the census taken in March, 1921, 20,517,606; this total is less by 255,583 than the estimate obtained by the "natural increment" method—that is, the progressive total obtained by adding yearly the excess of births over deaths to the last census population. This deficit is to be attributed mainly to emigration. As compared with the 1911 census (19,337,146), there has been an increase of 6·10 per cent.; males number 11,204,834 and females 9,312,772, these figures showing increases of 5·63 and 6·69 per cent. respectively. Lieut.-Colonel W. H. C. Forster, I.M.S., director of public health for the province, who forwards this report for 1921 considers that the broad result is satisfactory; "owing to devastating epidemics population does not increase rapidly in the Punjab, the total increase in British territory since 1881 being only 3,746,114." An

* Lahore, 1922. Supt., Govt. Printing.

actual decrease has occurred in six districts, amounting in Gurgaon, Dera Ghazi Khan, and Jhelum to 6·47, 6·16, and 5·68 per cent. respectively. For the province as a whole there has been an increase of 5·92 per cent. among Mohammedans, who form more than half of the population; of 4·66 among Hindus, and of 90·82 among Indian Christians. The general birth-rate, 41·5 per 1000, was 1·4 less than that of the previous year, but 1·2 higher than the mean of the previous five years; the highest ratios were registered in Lyallpur (48·7), Gurdaspur (47·5), and Amritsar (47·3) districts; in the exceptional district of Simla, with the small population of 40,937, the ratio was only 20·0 per 1000; the next lowest ratio was that of 30·2 in Dera Ghazi Khan. The provincial rate was higher than that of any other, Central Provinces coming next with 37·90, and Madras showing the lowest ratio of 27·05 per 1000. For males the ratio (21·9) was 2·3 in excess of that for females, the same as in 1920.

The general death-rate of 30·1 per 1000 was 1·5 higher than that of 1920 (due to cholera and malaria), but 8·8 less than the five-year average; for males it was 29·7, and for females 30·6. In the neighbouring United Provinces the rate was 39·57, while in Burma it was only 21·45, and in Madras 20·18. In the districts of Kangra and Rawal Pindi the ratios were 56·5 and 47·7, due chiefly to cholera, plague, and fevers; in Montgomery and Sheikhupura only 16·5 and 18·5 respectively. The infantile mortality, 195·78 per 1000 births, exceeded that of 1920 (182·85), but was appreciably less than that of the previous quinquennium (215·55). Amongst Hindus the ratios were 209·39 and 195·38, amongst Mohammedans 206·08 and 177·63 for males and females respectively; while for Indian Christians they were 148·0 and 142·4, this comparatively low mortality being probably due to the attention devoted to them by the missions concerned. For the province generally the urban death-rate of 33·46 per 1000 exceeded that of the rural districts (29·76) under all the heads of mortality except "fevers," in which group, however, plague deaths may have been included in the country districts. Among these latter the total mortality varied from 16·57 in Montgomery (with a fever ratio of 13·61), and 18·92 in Sheikhupura (Lahore), also with a fever ratio of 13·61; to 46·36 (fevers 32·49) in Rawal Pindi, and 56·55 (fevers 33·03) in Kangra. In the towns the total mortality varied from 2·18 per 1000 in Mian Channu (Multan district), and 2·53 in Okara (Montgomery), to 76·65 in Kangra and 84·08 in Dasuyah (Hoshiarpur), cholera and fever being the chief fatal diseases, with the addition of dysentery (16·20) in the case of Kangra. It is impossible to attribute such excessive variations to climatic causes; there must be local conditions (presumably capable of improvement) that need attention. Relapsing fever prevailed in some districts, and is said to be of special interest in the province, although there is no heading in the tables showing its local incidence. In Palampur *tahsil* of Kangra district 34 villages were infected, the disease having been introduced from the contiguous Native State of Mandi, where it is said to be prevalent; in Simla town there were 41 cases, with 7 deaths. The disease is frequently overlooked, and Lieut.-Colonel C. A. Gill, chief malaria medical officer, considers that the total mortality from this cause was not less than 26,000. Enteric fever is not separately recorded for the province generally, but in Simla town there were 12 cases, four of which, however, were imported. Dysentery and diarrhœa accounted for 11,826 deaths (0·58 per 1000), as compared with 0·47 in 1920 and 0·58 in the quinquennium; at Rawal Pindi the mortality was 4·73, at Sheikhupura and Montgomery only 0·01.

The mortality from cholera was the highest on record since 1900: the deaths numbered 19,215, compared with 138 in the previous year, and the mortality ratio was 0·94 per 1000, against 0·01 in 1920 and 0·12 for the previous quinquennium. Every district throughout the province was affected, that of Kangra, in Jullundur division, having a death-rate of 7·5 per 1000, and in the town itself, 15·92 per 1000; in the small town of Dasuyah, in Hoshiarpur district, the mortality was 34·2 per 1000. The province was entirely free during the first three months of the year; the epidemic commenced in April, reached its climax in September (when there were 7279 deaths), and practically came to an end in October. The disease was introduced in April by a man coming from an infected house in Delhi to the Gurgaon district, but did not spread owing to prompt action by the district M.O.H. Later in the month infection was again introduced by pilgrims returning from Hardwar to Kangra. "The epidemic emphasises the necessity for a district preventive staff. Given prompt information of an outbreak, and the staff necessary to deal with it, cholera can be easily checked." More district medical officers are required.

As regards sanitary works in general there is not much to be recorded. "On the whole, it may be said that the policy of framing rules and regulations for villages is the failure it deserves to be. . . . The villagers do not want rules and regulations, and in this respect do not differ from any other rural population. They do want material assistance, which it is within the power of the district boards to give. Instead of framing rules the district boards should concentrate on the policy urged by the sanitary board—a district health agency, and a standard of one dispensary per ten square miles. . . . The rural water supplies in large areas of the province are in a deplorable state, and the sanitary board has the utmost difficulty in getting projects put forward for the improvement of this state of affairs." This appears to be rather pessimistic; on the other hand, a long list of works of public utility, constructed by private individuals at their own expense, shows that there exists a very great deal of public spirit among, at any rate, some classes in the province, which deserves, and, no doubt, receives due recognition.

CANADIAN MEDICAL DIRECTORY, 1923.

THE sixth edition of the Canadian Medical Directory contains over 450 pages of text, and is divided into three parts. The first part deals with information concerning the reciprocity of medical licences between Canada and Great Britain, the Medical Council of Canada, and the Canadian Medical Register; the universities of the Dominion; Soldiers' Civil Re-establishment Hospitals; agencies for diagnosis and treatment of tuberculosis; and physician-coroners and specialists in the various provinces. The second part contains, under a heading for each province, full particulars of medical laws and regulations, lists of colleges, departments of public health, hospitals, sanatoriums, &c., and medical associations and medical journals, together with place lists of physicians, surgeons, druggists, and dentists. The third part comprises alphabetical indexes of all names of physicians, surgeons, and dentists, and general lists of veterinary surgeons, opticians, chemists, chemical companies, dental laboratories, and dental supply manufacturers, &c., in Canada and Newfoundland.

CAMPAIGN AGAINST MALNUTRITION IN AMERICA.

A PAMPHLET prepared by an Advisory Committee on Foods and Nutrition of the National Child Health Council has just been issued as a bulletin by the United States Public Health Service (Bulletin No. 134, 1923). It is the outcome of a study into the incidence of malnutrition amongst children in the U.S.A., the principal causes of malnutrition being discussed, and suggestions being made for preventive and corrective measures. Among the common causes of malnutrition are mentioned physical defects, such as nasopharyngeal obstructions, carious teeth, and other more serious conditions. In many instances the correction of such physical defects is all that is necessary to give a child the chance to develop normally. Other causes are improper diet and faulty health habits, lack of home discipline, faulty posture associated with over-fatigue, inadequate and unsatisfactory sleeping accommodation, as well as more general community conditions—bad housing, insanitary school buildings, atmospheric contamination, and the like. Suggestions for a campaign to combat malnutrition include: (1) Preventive nutrition work, as part of a programme of health education for all normal children of school age; (2) corrective work for school-children who are physically subnormal and in need of special attention; (3) nutrition work with children under school age, both normal and subnormal.

Special emphasis is laid on the value of work among children of pre-school age, which should tend to reduce the necessity for corrective measures among school-children. In addition to thorough health examinations and medical supervision, home visiting is regarded as vital, the visitor working with the mother, and helping her to correct unfavourable conditions. It is recognised that the problem in rural districts presents different features from that in cities, and suggestions are made by which local interest may be aroused and local service enlisted. The pamphlet may be studied with profit by all those who are working on cognate lines in this country.

Messrs. William Heinemann (Medical Books), Ltd., will shortly publish "Aromatics and the Soul," by Dr. Dan McKenzie and "The Hygiene of Marriage," by Mrs. I. E. Hutton, M.D.

BY a regulation dated May 16th the Home Secretary has revoked No. 1 of the Dangerous Drugs Regulations, 1922 (S.R. & O. 1922, No. 1087), which provides that a prescription for dangerous drugs may not be given for the use of the prescriber himself.

Circular 325, dated July 17th, 1922, with reference to prosecutions for selling milk deficient in fat, has been withdrawn by the Ministry of Health. This circular has not produced the effect which was intended, and the Ministry expresses its reliance on the responsible local authorities to administer the Sale of Food and Drugs Acts with fairness and consideration.